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## NEWS IN BRIEF

### Job cut fears at Plessey

FEARS of redundancies at Plessey's factories in the North West were aroused when management called a special meeting for yesterday (Wednesday). Full-time officials and stewards were invited to attend from several unions including ASTMS and the electricians' union, the EETPU.

The company released no details of the agenda, but there was speculation that hundreds of redundancies would be involved, due to reduction in Post Office orders for telephone transmission equipment.

### Exclusive agents

AN EXCLUSIVE wholesale agency agreement has been signed between Pertec and Compelex for the distribution of the MITS Altair range of small business systems in the UK and Eire. As part of the agreement, Compelex is to expand its support activities for the range, and is soon to move its headquarters from Kilburn, London, to a 5,000 square foot facility in Old Church Street, in Chelsea.

### Name change

THE refurbishing centre near Heathrow is the last division of Telex to start using the Memorox name after the takeover in January (CW, January 20).

### Computers exempt

COMPUTERS were exempt until 1987 from an EEC free trade directive, which took effect from Saturday. All public authorities must allow any firm within the community to tender for contracts worth over £130,000.

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## Dol to announce £20m scheme for micros

AN INTERIM £15-£20 million scheme to support the application of microprocessors is due to be announced this week by the Department of Industry.

The scheme has been developed over the last six months (CW, February 16) as a means of encouraging British industry to develop applications of microprocessor chips. It was originally thought that, at the time of formal announcement, it would have a level of financial support similar to the

microelectronics manufacturing scheme, which the National Economic Development Office says should now total £240 million, with some £80 million coming from the Dol.

This week's announcement, however, will be for an interim support scheme, intended to generate a quick interest in the area.

Further extensions to the expansion of the scheme are expected to be announced in the future.

There will be three main strands to the

support scheme. The first will be to promote an awareness in industry of the ways in which microprocessors can be used. This educational exercise is seen by the Department as being most important to the scheme's success.

The second strand will be subsidised feasibility and consultancy studies of general application areas, while the third will be financial support for specific projects.

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## Burroughs set to launch a fast ROM

By Keith Jones

A READ only memory with a very fast access time and complete non-volatility looks like being introduced soon by Burroughs Conversion Devices of Troy Michigan, the firm that developed the amorphous semiconductor material on which it is based. The manufacturing agreement is the second between Burroughs and ECD. Under the first, signed in 1975, Burroughs took over the development of the Ovonic memory.

The Ovonic memory has a read time of the order of 15 nanoseconds, requires no refresh pulse, is bit by bit alterable and can be reprogrammed electrically.

The development of amorphous semiconductor technology has been pursued with great dedication since the early sixties by Stanford Ovshinsky, boss of ECD (CW, July 21, 1977). Apart from Burroughs, it is now being taken very seriously by IBM which is using amorphous material to replace the existing unsuccessful Gross

Registers about 18 months ago. Chubb and Son has run down virtually the whole of the once thriving Gross marketing operation overseas and is introducing a new range of electronic cash registers to replace the existing unsuccessful Gross equipment.

Gross made a pre-tax loss of £1.7 million in the 14/15 months between being taken over and the end of Chubb's last financial year, and accounted largely for a fall of more than £500,000 in Chubb's overall profits, compared with the previous year.

Amorphous semiconductor film could also have great potential as a means of converting an light directly into electricity. It is considerably cheaper than the crystalline semiconductor material used in conventional electronics.

Ovshinsky's financial backers

include powerful Japanese busi-

ness interests and William Simon, former Secretary of the US Treasury.



### Chubb runs down Gross and designs new range

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According to the information we received, a special teashirt has been produced for the occasion, to be issued to all delegates. The picture, however, is described as showing Peter Holmes

Forfeit from us to me that is improbable.

### Fibre optic link for District Line

TWO developments have been announced which underline the revolutionary potential of fibre optics in telecommunications.

GEC's Telephone Cables Ltd subsidiary has been awarded a contract by London Transport to supply and install a seven kilometre fibre optic link along the District underground line between Earls Court and Acton stations.

The Chubb spokesman added that the Gross marketing operation in Australia was now being run on a "bare bones" basis. The Italian subsidiary had been sold, the French subsidiary had gone into liquidation and sales in the US were now "very small".

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## SCR to give details of grants

DETAILS of the grants to be awarded under the Select Research Council's Distributed Computing Programme are expected to be announced in a few days. The programme (CW, April 28, 1977) is intended to discover the fundamental principles governing how a distributed computing network should be structured, concentrating on micro-based networks.

The SRC has also announced a scheme to finance joint research by universities and industry. Funds have been allocated for a three-year period allowing up to £500,000 per year to be spent by the Council.

Research projects under the scheme would be chosen jointly by a university or polytechnic and an industrial firm. The research would have to increase knowledge and standards of education, as per the SRC charter, and also improve industrial operations.

### Two-day strike

ASTMS and TASS members at GEC's Stoke, Coventry plant returned to work last Thursday after a two-day strike in support of the 16 operators sacked by the company and 100 contract engineers who were under suspension.

The contract engineers went back to work on Monday.

The GEC operators' dispute is discussed in Op Spot, page 12.

### NCC in profit

THE NATIONAL COMPUTING CENTRE is now operating at a profit, and no longer needs the government grant-in-aid that has been supporting it since its inception in 1964. Ferranti has reported healthy increases in both profit and turnover in the results for financial year ended March 31.

Turnover was £158.0 million, compared with £125.4 in the previous year, while pre-tax profits, at £9.12 million, were up 49%.

CONTINUING: a steady improvement in its financial position after having rescued by the National Enterprise Board.

Delegates will return by air.

The conference will consist of morning lectures on such subjects as the nature of computer disks, case studies, and defensive strategies. There will be informal question and answer sessions,

and a minicomputer for demonstration.

The conference is organised by Peter Halme of 20th Century Security Education, Leatheshead.

Attendance costs £700; further information from Leatheshead 74505.

According to the information we received, a special teashirt has been produced for the occasion, to be issued to all delegates.

The picture, however, is described as showing Peter Holmes

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PO demo

A DEMONSTRATION in London was held last Tuesday at all ten London branches of the Post Office Engineering Union in support of their negotiations for a 35-hour week and in protest against the sending home of more than 80 members for refusing to install equipment.

That seemingly self-condemning conclusion has been reached by one of the 10 task forces set up by the Carter Administration, to provide reports that will go to make up the US Federal DP Reorganisation Study. That study is itself part of a wider study initiated by President Carter, shortly after he took office, and called the Preudent's Reorganisation Project.

Five task forces have now reported, covering personnel, acquisitions, standards, small departments, and human resources.

All the task groups were severely critical of federal DP processes and managers but one top government official commented: "Not one finding in any of the five reports is new to

any of us. The problems have been around—and have been identified—for many years. The big problem is not in identifying but in acting on what is wrong with federal DP."

The human resources team was the most outspoken on the point of the proliferating number of studies. "It is time that the Preudent declared a moratorium on further dupli-

cative studies while the government consolidates the best of what has already been done and takes action," it concluded.

Ironically, it recommended that the Preudent should set up another task force—to study and rationalise the work of other task forces and studies over the last three years.

● More on the report, page 33

## Too many studies into US govt DP?

THERE are serious and well-known deficiencies in US Federal DP operations, but the government spends too much time investigating overlapping studies aimed at identifying rather than solving the problems.

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● More on the report, page 33

## Stars all set for Palace

HONOUR in the Midlands hosts of Computacenter were named by two of the competition's best supported teams, Solcom Computer Services of Milton Keynes and Peterborough Data Processing.

On a sunny day at the New Alexander Stadium, Birmingham last Sunday, the men's event was won by the Peterborough team, with the team's No 1 man, systems engineer Dave Boardman, winning the men's individual event, despite being beaten in the final event of the day, a greasing steeplechase, by men's individual

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COMPUTER WEEKLY'S INSIDE NEWS

Computer Weekly International is once again jam-packed with news from Italy of government look at its computer industry.

In addition, there is an interview with ex-IBM database guru James Morin (page 13), a detailed look at a controversial French report (page 18) plus the usual features and news service.

ALSO...

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Deputy Editor  
Tony Higgins  
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Advertisement Manager  
Harry Hansen  
01-261 8022  
Class Ad Manager  
Brian Durrant  
01-261 8597IPC Electrical Electronics Press Ltd,  
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may be contacted directly on the  
extensives listed below. Other de-  
partments in Dorset House may be  
contacted by dialling (01) 261 8000.

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Keith Jones  
021 6244  
Tim Palmer  
021 6037  
Peter Gossell  
021 6030  
Steve Johnson  
021 6026  
Martin Banks  
021 5500  
Robin Webster  
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# DOWNTIME

by Chad

## Where to place the UK memory plant

MITCH has been made of the fact that blunt northern English place names seem to do little to disaster the NEB's jolly plan for an all-British semiconductor memory plant. Certainly the euphonious Spanish names in Silicon Valley — Cupertino, Palo Alto, Santa Clara — are difficult to match. Even Sunnyvale somehow sounds a nicer place than Port Sunlight.

But a glance at the map shows that there are in fact some splendidly appropriate locations to be found in and around the central north.

Even if Mosley is ruled out as being too far south, Moss Side, Manchester, can certainly put in a reasonable claim for consideration, while Ibstock, Derbyshire, has delightfully evocative echoes of the dark days when Britain stood alone amid the gathering gloom.

Critics of the whole plan insist that only RAMbottom brings out the true utility of the project, but on balance I prefer the quiet optimism expressed in the name RAMshape, which is to be found at the foothills of the Chevelles in Northumberland.

# NCC sponsors US programming project

WHEN competitive systems consultancies and software houses combine the management, marketing and technical skills of their senior staff, something exciting is the motivator. The Interlock export project is precisely this. Aimed initially at the vast US market on an offshore programming basis, it is sponsored by the National Computing Centre and has been developed in conjunction with six systems houses, selected from among over 80 tenders for their complementary export experience.

The NCC went out to tender for the preliminary work necessary to get the project off the ground in April last year. Work by the main participating companies; Altergo and Peat Marwick Mitchell with the project manager from Data Logic, now acquired by the Raytheon Cossor group, was supplemented by contributions from Dataskill, F International and Pactel.

In a chicken and egg situation the NCC had the difficult task of planning a market drive in the US while not knowing the



**Steve Shirley**, director of F International, has been acting in a consultative role to the National Computing Centre's Interlock scheme for the export of Invisibles, in the form of programming, to the US. Here, she describes one such scheme, sponsored by the NCC, which has been developed in conjunction with six systems houses. Altergo, Peat Marwick Mitchell, Data Logic, Dataskill, Pactel, and F International. Consequently, a drawing board project has crystallised into a working proposition and the UK now has a specific remote programming service to offer American clients.

package of services which the Interlock team was going to come up with as feasible. Not surprisingly, six participants meant six initial reactions on most points. Surprisingly, however, members talked freely about their export experiences, approach to programming assignments, contracts and much which is normally classed as stock-in-trade.

Agreement can be reached with amazing speed when top professionals approach a problem with a common aim. Indeed the opportunity to plan properly a disciplined approach to offshore programming, with the very real prospect of sizeable US contracts being obtained in future years perhaps nearer than 1978, even overcame any reservations about speaking so freely among ones competitors. The calibre and mature personality of the project leader from Data Logic, Robin Williamson, was and still is a significant factor in binding the team together.

For in the interim months, a drawing board project has crystallised into a working proposition — the UK now has a specific remote programming service to offer American clients — and indeed the first success was a \$90,000 a year software consultancy contract awarded to Altergo late last year. (CW: January).

The working proposition has several quite distinct components. Firstly, a fully documented "control manual" setting out mandatory procedure, minimum procedures, and guidelines etc. to the flow of management and technical information between US client and UK supplier via control centres.

The control manual, a technical

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## Automating by degrees

DO you ever get the feeling that you can't get away from computers anywhere these days? I was at the Degree Show of the Royal College of Art, as unlikely a place for technological thinking as one could imagine; but sure enough, our ubiquitous trade reared its head in several places.

One graphics student was working on the design of characters on VDUs, using elaborate home-made electronic models. Another had produced a set of large colour display characters for Cefax, and had

studied the problems of laying out Cefax pages effectively.

An industrial designer had made a full-scale mock-up of a combined VDU and printing terminal, with the printer sitting in front of the screen and swinging up out of the way in an ingenious manner when not required.

As might be expected, in the Design Research Department there were descriptions of theoretical studies about "computer modelling and gaming being important tools in the participation of a criti-

cally insightful activist lobby in enhancing environmental awareness... Social Science waffle is ubiquitous too.

The rest of the Show, by the

way, was the most amazing collection of graphic designs, ceramics, glass, textiles, furniture, and industrial designs, highly original and produced with exquisite care. There was a complete set of spoof World Cup stamps, complete with first day cover depicting two footballers embracing à la Rindin, which the Post Office humorously turned down for public use.

## The spice of conference life

THE Services Congress at Barcelona was a refreshing chance for my reporter to get up-to-date with the latest American slang. For instance, he discovered that those called on the programme "Accompanying Persons" (in former sexist days, "Wives") are known at conferences in the US as "Spice".

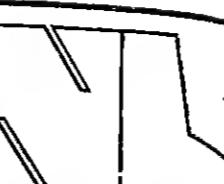
Spice is the plural of Spouse,

get it?

He also picked up some gems of conference double-talk, much of it, let it be known, from non-Americans.

A Frenchman giving a paper about bureaux hit by competition from microcomputers kept talking about "negative growth".

Best deliberate crack of the Congress came from the president of MSA Inc, J. P. Imay, who hails from Jimmy Carter country — Atlanta, Georgia. He described how he had been made responsible for getting the President's brother Billy to the Inauguration. Said he, "We had terrible trouble getting hold of a bullet-proof mule."



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- \* Video Output for External Monitors
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# GILB'S MYTHODOLOGY

*Automatic correction of simple input errors should be the norm*



WE think we are advanced with our online interactive terminals. Yet one of the main excuses for the interactive technology is the ease with which simply input keying errors can be corrected immediately, while the source document is still present, or the telephone contact is still on the line.

Personally, I would maintain that the use of human operators to correct my errors which are easily correctable by computer logic, is a misuse of human beings. It is not productive. It does not speed throughput. It is not economic. It is not reliable.

I believe that most common errors can be fully automatically corrected. I am speaking about errors such as the random and accidental keying of a single character or misinterpretation of a single character, which accounts for about 80% of the typical errors.

I find very few systems which actually practice automatic correction of any sort. I find that the typical systems designer has received no training in the subject, has no experience in the subject, and is not required by his management to do such things. The fact that such techniques work and have done so for years in some installations, does not bother him in the slightest.

One prerequisite for automatic correction is the same as with automatic correction using parity bits. We must design more redundancy into the input. There are many ways to do so, such as humanised codes (John JONES, SURREY), such as checkwords (23456-JONEJ), repetition (23456-23456) or even multiple check digits.

This brings us to the next issue. The use of a file to enable us to make corrections is a critical prerequisite for most practical correction attempts. Further, we need the direct access capability of looking around via different search

keys, at sequential or similar groups, and at random.

We need to be able to match input data (such as a payment amount of 235.85) entering in with faulty identifiers against similar (billed 235.85) data on the file. This use of additional data elements in the input, and matching exactly or approximately against the file data is a powerful tool in confirming a correction hypothesis, or selecting the most probable alternative from among several possible corrections.

Any attempt to do automatic correction without making use of this additional data related to the faulty data element, will be unnecessarily difficult.

The exact logic or correction procedures follows naturally for an examination of the common sense human correction procedure. It is important, however, to recognise from the outset that the objective is rarely "perfect correction of all errors". A more realistic objective is to automate the bulk of all common corrections, leaving the really difficult ones for human oversight.

Sometimes we apparently do correction of errors by the simple trick of ignoring the "errors" when they occur at the end of a concept. We can do so in some cases because we have carefully designed the

subsystems (SACs, SMACs & discs) from the 2960 to the 2970.

In line with many manu-

turers, ICL restricts the ex-

use of microcodings to its

machines, the 2950 and 2960 opting to hard-wire the large 2970 and 2980 systems.

The benefits of DME, a high

efficient microcoded emula-

tion, have thus been denied so far to 297X users, who have had to make do with Meep. A software emulation facility, Meep is not less efficient, is appropriate for small workloads and it is attracted very little use.

The new option to attach

2960 order code processor offer a significantly easier path to 2980 conversion than was available before and should help considerably to increase the appeal of the larger 2980.

Interestingly, the announce-

ment coincided with the release of DME+, an enhanced version of DME 1900 for the 2960, which offers a 25% improvement in performance (CW, June 15).

As the VME/B workload grows, users can switch an increasing portion of the storage

## LETTER TO GILB'S MYTHODOLOGY

### Why verification is necessary

I REFER to Tom Gilb's Mythodology entitled "Verification Dead - Almost" (CW, June 15). My reply is "Verification not yet extinct - but an endangered species".

In international banking, where extremely high value funds transfer transactions are processed in real time, it is not at all uncommon, particularly in the latest minicomputer-based, dedicated processor applications, to find carefully designed key-verification techniques incorporated. This is not, in my view, a sign of "lack of imagination or of training of the designer" as Tom Gilb glibly claims, but quite the opposite.

In Citibank, which is certainly not renowned for its lassitude in keeping pace with technology nor for its lack of imagination in systems development, verification is still sometimes used. Conversational, program-drive, error-repairant data validation techniques are, in selected instances, supplemented by

In an age where such trans-

actions cause funds to be made instantly available in other continents, the highest levels of transaction security are justified. Such modifications, together with errors in setting up critical standing data, would be difficult to prevent or detect by any of Gilb's 13 listed alternatives, other than number 12 (let the customer spot the error) which would certainly not earn a great deal of respect (or future business) from the plaintiff client.

To conclude, verification - as a means of providing error detection is, in most instances, out-performed in terms of effectiveness per pound spent by the more sophisticated error-repairing controls now available to the designer of online systems. However, in terms of fraud prevention/detection, and particularly in certain low volume/high risk applications it still has a justifiable place.

RONALD J. WARMINGTON  
London

## PROGRAMMER NOTES

### Labour costs force employers to look for predictability

Over the past few years computing has emerged from a fine art to a non capital-intensive industry where the major cost is now people.

This minor revolution has made hardware so inexpensive in proportion to people costs that now management wants different programming skills from five years ago.

Generally an applications programmer will not now be recruited for his skill of coding three milliseconds off the timing of an algorithm. What the manager wants now is predictability.

Predictability has two aspects: speed and arguably less important, quality. Basic quality requirements would be that a system works, but efficiency.

Sex discrimination is out. One manager even thought: "Programming is in danger of becoming a woman's job." To be fair, he also felt that women tended to be more consistently reliable, whereas men are more prone to flashes of inspiration and hard work.

The successful job applicant is likely to have proven experience. Ideally, the candidate will have followed a project from inception to completion and be familiar with those parts

whereas my aim is to meet deadlines at a profit."

So, for many managers, values who can produce a working program within the given time period, albeit with a few minor bugs to be ironed out, is just as valuable as an established programmer. But training and experience is the successful candidate likely to have.

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## SOFTWARE FILE-1

### Hardware economy in DME option for ICL 2972s, 2976s

FURTHER details have been given by ICL on the new facility which enables a 2960 order code processor to be combined with one of the new 2972 or 2976 systems (CW, June 15).

The facility enables those users converting to a large 2900 under VME/B to economise on hardware by getting rid of their 1900 or System 4 hardware at once. By installing a 2960 order code processor, which costs about £188,000, users can run unconverted applications under DME on their 2972 or 2976 configuration.

This is possible because the 2960, 2972, and the new version of the 2976 all use the same store access and store multiple access controllers and the same main memory. A 2960 processor installed alongside a 2972 or new 2976 can thus be allocated a portion of the resources of the host configuration.

In this way, the configuration can be running VME/B and DME simultaneously, though the two systems are at all times functionally independent.

As the VME/B workload grows, users can switch an increasing portion of the storage

## SOFTWARE FILE -2

### Intensive format for delegates

AN annual event, the Inter University Computing Committee Computing Colloquium brings together representatives from both computer science and computer services departments throughout the UK. Attended this year by over 200

delegates, the three-day colloquium is valued chiefly as an opportunity to exchange ideas. Intensive in format, the programme this year included nearly forty papers on topics ranging from microprocessors to regional computer networks.

200

of a Pascal system for Data General's Nova minicomputer. Based on the Pascal P compiler, this software has been distributed to around 100 sites worldwide.

The university is probably best known for the development

written in Nova assembler and occupies about 2K of memory. The system in addition includes a monitor program, written in Algol, and a Pascal program, for assembling blocks of P-Code.

Other work at Lancaster, also involving the development of a language, includes a project on information retrieval, from library type structures, and the application of finite state automata theory to the design of communication systems.

• Lancaster is to take delivery of an ICL 2960 early next year. Replacing a 1905, the new machine will form part of the North-west Universities' Regional Network, which currently includes mainframes and communications equipment at the computer centres of Lancaster, Liverpool and Salford.

### Trebled its sales

OVER 80 sales of the TPS teleprocessing monitor in the last year have helped Telecomputing to treble its annual turnover. Results to the end of September are expected to show revenue of £1.2m for the year as opposed to £398,000 for last year.

### PETER HEWITT REPORTS FROM THE IUCC AT LANCASTER

### Language-oriented research is main concern

THE predominant concern at Lancaster University, host to this year's Inter-University Computing Committee Computing Colloquium, is language-oriented research.

The heart of the system is a P-code interpreter, which is

written in Nova assembler and occupies about 2K of memory. The system in addition includes a monitor program, written in Algol, and a Pascal program, for assembling blocks of P-Code.

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## 'Mathematical content is underestimated'—Dijkstra

PROFESSOR Edsger Dijkstra, renowned for his original thinking on structured programming, spoke last week at Lancaster of the inherent difficulty of the programming task.

Implying that what he had chiefly in mind was the mathematical expression of program requirements, Professor Dijkstra was speaking primarily in the context of the use of Invariants.

"Whini we need is a collection of beautiful programs described in such a way that they are palpable. Although some very shrewd and inventive algorithms are published, they are usually completely impossible to understand.

"It has been said that in mathematics, each generation stands on the shoulders of its predecessors. In software, we stand on their toes. One reason for this is that computer scientists as a whole have not yet learnt to how to present algorithms.

"What one has to do in this respect is identify the optimum order in which to introduce relevant aspects."

## CASE MULTIDROP MODEMS



## PROGRAMMER NOTES

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So, for many managers, values who can produce a working program within the given time period, albeit with a few minor bugs to be ironed out, is just as valuable as an established programmer. But training and experience is the successful candidate likely to have.

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**OP SPOT**

# Opcomm undeterred by lack of support

WHEN Opcomm arrived on the operations scene last February, there seemed every possibility that it would develop into an organisation capable of raising the status accorded to operators.

But the Coventry-based group has experienced difficulty both in terms of recruitment and persuading its members to attend meetings on a regular basis.

Can the group solve these problems and go on to fulfil its considerable potential, or is it always to consist only of a small band of operators who have sufficient drive to carry on with their support?

The latter now seems the more likely answer, after a talk I had with Russ Itman and John McGinn, following a meeting held at Lanchester Poly in Coventry last week.

Itman said, "We now have a hard core of half dozen or so members who come to every meeting, and others who attend now and again."

Searching for reasons for the poor attendance, he continued: "The fact that operators have to work shifts doesn't help matters, but perhaps we have been too slow in putting ourselves forward."

## The dos and don'ts of HOLDING jobs

If operations staff make good use of their technical knowledge, the operating system will sometimes offer a number of ways of overcoming a difficult situation.

I say this after considering some of the comments made in a letter from Sam Sexton, who is a member of the operations support section at the Coventry site of Massey-Ferguson.

He writes in response to an Op Spot in which I attempted to show how an operator, in the IBM OS/VSE environment, might use the operating systems facilities in order to maximise throughput and ease his task (July 27).

On that occasion, to stimulate a "difficult situation," I described the predicament of an operator alone in the computer room, with the system claiming for disk and tape to be mounted, and "demanding stationery changes on the printer."

To save the unfortunate operator having to run around in circles, I suggested that he might use the OS/VSE HOLD and RELEASE commands in the following manner:

Firstly, he should use the

first project was to carry out a survey, commissioned by Computer Weekly, into the computer room environment.

This involved contacting over 40 sites in and around the Coventry area.

So Opcomm is very active

and, in spite of its size, has a lot of experience in terms both of time spent in operations and the operating systems used.

"Together we have know-

ledge of all the most widely used mainframes," said McGinn.

He continued: "In addition, we have a lot of other people who are interested in what we are doing, but are unable to attend our meetings because they live too far away."

**HINT OF THE WEEK**

### Use macro to save typing

THE use of macros in the ICL George 3 environment is the subject of a hint sent by Terry Stevens, a shift leader at the Brighton site of the University of Sussex.

He says, "By using macros, the operator can save himself a lot of typing when he is responding to system requests."

According to Stevens, when a job running under George 3 requires a printer to be engaged, or allocated, it will give the operator the following message:

**CD ENGAGE UNIT U14**

If the operator is unable to allocate the printer, for example, because of a paper jam, he must type in the following reply:

**CD ENGAGE UNIT U14**

Says Stevens, "To save typing this in every time a macro should be used." He gives the following example:

**INPUT : MACROS, CD14****CD ENGAGE UNIT U14**

EX

Says Stevens, "Once this has been done, the operator has only to type in 'CD14'."

He also points out that macros may be put to good use in relation to the alignment of pre-printed stationery. For example, to ensure that the line-up of pay slips is correct, the system might give the following message:

**:SALARIES,PAYRUN , ARE PAYSLIPS ALIGNED OK?**

In response, the operator must enter the following:

**:SALARIES,PAYRUN,YES OR NO**

He puts forward the following macro:

**INPUT :MACROS,PAY****AN :SALARIES,PAYRUN,%A**

EX

Says Stevens, "After this has been added to the macrofile, the operator has only to type 'PAY Y(OR)N'."

### Away from noise and bustle

WHILE visiting the Swindon installation of W.H. Smiths, I was very impressed with the rest room provided for the operations staff. In addition to the room itself, there is an area where food can be prepared and eaten.

Then he should consider the jobs which will request tapes and discs and reorganise the queue to ensure that those using the same media run in sequence or concurrently. Then RELEASE the queue.

In my opinion, all sites should provide such facilities so that the operators can spend their break well away from the noise

of the computer room, particularly during the evening and night shifts.

However, in many sites fail to pay attention to this matter, with the result that the operators are forced to visit the local public house in order to get a break.

What facilities are provided at your site? Op Spot would like to hear from you in this regard.

By Bernard Allen

## Perks, essentials—where should the line be drawn?

"OUR control room staff work a 7am to 4pm, 1pm to 7pm shift pattern over a five-week period and receive a 7½ per cent shift allowance.

Cooking facilities. These are essential for staff working on the evening and night shifts. Snacks from a vending machine are all right, but are no substitute for cooked meals.

Training schemas. It goes without saying that training is vital if staff are to function at optimum level and have decent chance of career progression.

Reduced mortgages. Many financial concerns provide for staff who are married and over a certain age. In my view such "concessions" give the company hold over its employees.

Club rooms. While I do not consider these to be essential, I do feel that they provide a pleasant break for staff, particularly those working the evening and night shifts.

Finally I would like to consider some of his other comments: those on car losses, and remaining on site during the night shift even though all work has been completed.

Meeting operators from other installations has made him view his own site in an even poorer light. He continues: "Speaking to engineers and operators from other sites, I realised that some operators get 'perks'. These sometimes include training schemes, cheap mortgages, a rest room, cooking facilities, club rooms, and others."

Well, if operators working shifts are not essential carriers, I do not know just who does fall into that category. Too few sites consider the problems staff face in getting to and from the installation.

I can see no point in making the whole shift stay on site once the work has been completed, although one or two of the staff must stay behind to hand over the day shift. The shift leader should be in a position to draw up a rota so that everyone gets a turn in carrying out this task.

He concludes in a manner which sums up the mood of the letter, "At this point you are probably wondering why the installation is manned at all. Speaking for myself, I suppose I have got into a comfortable rut and my family enjoys the area in which we live."

Well, unfortunately his description fits too many installations. I consider some of the things he refers to as "perks" as being essential in the lives of computer operations staff. Let's consider some of them.

Rest room. Last week in Op Spot I said that operators must

operators often complain that nobody listens to their point of view. Well, Op Spot is listening and Bernard Allen would like to hear your opinions and ideas on all matters relating to computer operations.

Your letters should be sent to Op Spot, Computer Weekly, Dorset House, Stamford Street, London SE1 8LU. Telephone calls are equally welcome and Bernard can be contacted directly on 01-261 8038.

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# PO test service ready to go live

THE two GEC 4082 minicomputers which will soon form the basis of the Post Office's Prestel test videodata service, went live last Wednesday. After three days of testing, the computers were handed over to information providers on Monday for databases to be updated and, as soon as this is completed, the test service will be switched from the 4080s at Martlesham to the 4082s at Gresham Street, London.

The end of the year, have now been received by the Post Office and the first six of these, installed in selected homes, are currently being serviced by the research installation at Martlesham. The first 50 lucky users have been nominated by the television manufacturers.

The operators get a 17 per cent allowance for working a three-shift rota. For this my senior operator — who has over four years' operations experience — gets a basic wage of about £80 per week.

Sets for the first 50 users, who are due to go onto the system by

goes live to users.

It had been hoped to get the Gresham Street centre on the air sooner, but delays were caused by teething troubles with the software, which has been enhanced with several additional features including access charge data.

The information providers have now responded to the Post Office's proposals for the scale of charges once the service goes public next year (CW, August 17). The information providers regarded the initial Post Office proposals as unacceptably high, and a compromise acceptable to both sides is likely to be reached within the next few weeks.

Bell-Northern Research of Canada is working on a rival to the Post Office Prestel videodata system. Called Videotex, the Canadian system is to be given a market trial in 1980. A variant is under development which would allow users to send messages to each other's TV sets without going through the central computer.

## Crash progress

VERY encouraging performance of the ICL 2980 and a smooth transition to the BX27 release of VME/B has been reported by the Edinburgh Regional Computing Centre in its newsletter for September.

In the four-week period ending in August, the system achieved a meantime between hardware crashes of 27.8 hours and a meantime between software crashes of 18 hours.

## Experts meet to combat crime

A THREE-DAY conference entitled Science and Security dealing with possible scientific solutions to security problems was held in Brighton last week.

The conference, attended by about 150 delegates, was opened by ex-Premier Sir Harold Wilson, who visited a number of exhibition stands set up in conjunction with the conference.

These papers were presented under nine section headings and among these were intruder detection and alarm, encryption, explosive hazards, and access control.

The photograph on the left shows Sir Harold Wilson talking to staff on the Flexton Engineering stand.

## Computer link-up

THE deal between the Central Electricity Generating Board and Comptech, under which the latter will run CEB-owned ICL 2976 at its Bracknell computer centre on behalf of the Board has been completed (CW, September 14). As expected the CEB regional centres will use the 2976 for software conversion while Comptech bases its VME/B bureau services on the machine.

## Agency to show off British products

A NEW agency selling UK-made terminals and microcomputer systems under its own marque

Computrade buys equipment in bulk from manufacturers (British where possible) receiving appropriate discounts, and either sells it itself or appoints other agents around the country. Many small UK manufacturers, Tim Wilkes points out, have only one or two salesmen, and thus have difficulty competing against big overseas firms even when their product is superior.

To build a strong British computer industry, he says, "we have to go into the international markets and meet the foreign competition head-on and sell. This is our major aim."

Otherwise, he adds, there is a danger that the UK computer industry could go the way of the motorcycle business.

Anyone who would like to visit Computrade's exhibition should telephone, Claire Hanks, on 0373 77374.

## H-P offers System 35

OFFERING an alternative to minicomputers for high speed computation and instrumentation, Hewlett-Packard has introduced a desk-top computer, the System 35, that adds assembler language facilities to the Basic programming provided by the existing H-P System 45 desk-top machine.

The System 35 comes with four slots into which ROM modules holding the assembler and required I/O controllers can be inserted.

The module for assembling and executing programs costs £1,200, but H-P can also supply an execute-only module for £350. This module should be attractive to system house clients who want to sell machines that can execute their software while preventing their customers from modifying it.

The assembler is a plug-in ROM-based option not available on the System 45 and enables System 35 to be used to process inputs at high speed via a variety of devices via a selection of 32-character single line display.

## Stock control at PoS

A POINT-OF-SALE system, based on a micro, which uses virtual memory techniques, has been introduced by Ego Computer Systems primarily for stock control applications in the motor trade.

Already about £100,000 worth of orders have been received by Ego and some interest has been shown by British Leyland.

Built around the Motorola MC6800 microprocessor, the system is stand-alone and in its simplest form consists of the processor, with a minimum of 32K disc storage, a specially designed VDU, and a printer.

Typical information that the Ego system can handle includes part numbers, prices, stock levels, records, involving sales analyses, and re-ordering.

The system was developed at the London Sports-Car Centre, which is owned by Peter Ridge, who is also chairman of Ego Computer Systems.

The emphasis placed on the

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## PEOPLE AND EVENTS

Edited by Nancy Pocock

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Model 7008-7D09

- \* British design and manufacture
- \* Based on 8080 Microprocessor
- \* Two page Memory 3.840 Characters
- \* 24 Display Lines of 80 Characters per line
- \* Switchable Transmission Speeds from 60 Baud to 19,200 Baud
- \* Split Speed Transmission Mode
- \* Dual Interface—CCITT V24 and 20/60 mA Current Loop
- \* Hard Copy Printer Output
- \* Protected Field Format—Blink—Background or Hall Brightness
- \* XY Cursor Address (send and receive)
- \* Roll or Page Mode
- \* Video Output for External Monitors
- \* Full Character Editing Features
- \* Block Transmission from Screen by Line or Page
- \* Green Phosphor Non-glare



- Model 7001-7002
- \* 24 Lines of 80 Characters per line
  - \* Selectable Baud Rates from 60 to 19,200 Baud
  - \* Dual Interface—CCITT V24 and 20/60 mA Current Loop
  - \* Teletype Compatible
  - \* Hard Copy Printer Output
  - \* Selectable Half or Full Duplex
  - \* Video Output for External Monitors
  - \* Green Phosphor Non-glare Screen



- Model 7000
- \* Teletype Compatible
  - \* 24 Lines of 80 Characters per line
  - \* Selectable Baud Rates from 60 to 19,200 Baud
  - \* CCITT V24 Interface
  - \* Selectable Half or Full Duplex
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# High speed Z80A analyser launched

ANNOUNCED at Weston last week, the Z80A Microsystem Analyser or NSA from Millenium Systems of Cupertino, California, is now available in the UK from Microsystems Services.

Though Z80 based, it can also be configured to test 8080 or 6500 based systems, with 8085 emulation to be added by the end of the year. Each additional emulator costs £887 and a "signature analysis" option for £569 allows checking of bit streams at individual nodes in a system.

The NSA emulates the processor by plugging it into its socket in the system under test and it is claimed to appear in the system exactly as the processor chip, without any extra interface, up to the full 4MHz clock rate of the Z80A.

Customer written diagnostics loaded in PROM into the NSA

can set hardware breakpoints, allow single-stepping through programs, and alternate register, memory and I/O location contents to detect hardware or software faults.

This data can be displayed in the unit's 20 character, 16 segment alphanumeric display, or a fault message in English can be shown.

Light enough at 21 lbs to be used in the field, the NSA is also intended as a laboratory aid or production test instrument.

The Z80A system provides a high degree of emulation transparency for the Z80A micro. According to Larry Badinghaca, vice president of technical development at Millenium, the chip has passed problems in emulation, mainly because of its high, 4MHz operating speed. For emulation to work, the system must see the analyzer exactly as

## Courses for newcomers

**INFORMATION** on microprocessors is abundant. Intriguing articles for the newcomer (are there any newcomers left?) slim to explain the technology in simple terms. Seminars by manufacturers and universities serve to update engineers and computer personnel on new techniques, technical developments and newly-introduced devices. Such information is readily digested by the professional and also by the hobbyist. What qualified, self-respecting engineer or programmer hasn't taken some steps to further his knowledge of microprocessors?

If the opportunity doesn't arise at work — or cannot be made to do so — then self-education might be the result. Literature is sought and pored over and possibly some hardware is purchased.

Important as engineers and programmers are, it is senior

wants to learn simple and geared to the implications, effects and results, that is, the effect not the cause.

Any courses run specifically aimed at managing directors, senior managers and the people who sign the cheques to buy microprocessor or implement micro-based schemes should have clear-cut objectives.

A tremendous amount of effort must go into cutting the jargon down to half dozen terms. The subject must then be considered from the managers' viewpoint — what microprocessors will mean to him, what it will cost and what will be involved.

The course should serve to explain the present day importance of micros and why they are causing such a revolution. The essential features of a microprocessor and what it is and does should be discussed in the simplest way possible, backed

by audience so that the course can progress slowly and simply. And it must encourage managers to ask the questions that have been at the back of their minds, which they have been afraid to ask.

Add to this a variety of visual aids and demonstrations and you have an easy to understand introduction to microprocessors for the non-technical decision maker. The techniques to stress are simplicity, only the most essential technical details are introduced and even these are kept to an elementary level.

In our experience, once someone pushes the buttons to make the lamps light, the interest really starts. If this theme is developed, the managers will want to continue the next day with their own equipment, their industry and, with their ideas.

Our experience from a considerable number of courses has

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Practical Computing spoke to over 40 suppliers of personal computing equipment who estimated that there are already about 6,000 home computers in Britain, defining "home computer" as a system costing less than £1,250 and used typically by small businesses, hobbyists and educational establishments.

Of this market, it is estimated that about 4% are in use in educational applications, 25% in companies with a turnover less than £500,000 and 16% by home hobbyists.

In the Computer Weekly survey, the total current market was estimated at about 26.5 million rising to £37.5 million in 1980. Practical Computing said it believed the 27.5 million estimate in its survey veered on the side of the pessimistic estimates and believed the market could be even greater once large companies like ITT made a full impact on the market.

Practical Computing, which aims to cover the business, hobbyist and educational application of small systems, is available from bookshops throughout the country, price £5. Further details can be obtained from Practical Computing, 2 Duncan Terrace, Islington, London N1, Tel: 01-378 9517.

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# The New York Times

## The Times... they are a-changin'



While Fleet Street newspapers vacillate over the introduction of "new technology," the grand old lady of the US Press, the New York Times, has completed the changeover to an entirely computer-driven printing system, with journalists taking over their keyboarding from skilled compositors. RORY JOHNSTON (pictured left) reports on this upheaval within the ancient crafts of the Fourth Estate.

collaboration on the design from the Times' development staff.

Interestingly enough, there are some things which the new technology makes more difficult rather than easier. For instance, if a story is slightly too short to fill the space allocated, with hot metal it is easy to spread some of the lines further apart by inserting slivers of metal between the slugs. Cutting apart the lines on the photographic paper, and sticking them down again while trying to keep them straight and even, is a much trickier process.

The manual pasting-up of the pages may seem antiquated in the midst of all the surrounding advanced technology, but according to John Werner, the Times' director of R&D, no existing screen-based system would do the job to their satisfaction. One will come eventually, though, he is certain.

The printing unions did not agree to the changeover to new technology without a struggle. The contract for the current arrangement was signed in 1975, after many years of strife involving all the New York newspapers during which many titles, including the famous *American Tribune*, died.

The inexorable economics of the situation finally dawned on the unions, and they settled for an agreement providing sizeable financial inducements, staff reduction without sacking, but by attrition only, and retraining.

UK newspapers have hardly begun to introduce any of these changes, but there is little doubt they will have to do so eventually in order to survive. The most contentious issue is whether the journalists will protect printers' jobs by refusing to do direct keyboarding.

The NUJ has said it will, but in fact there is little love lost between journalists and printers (printers are paid considerably more on Fleet Street) and when it comes to the crunch things may look very different.

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The pasted-up pages, including half-tone photographs, are scanned at 1,000 lines per inch by a laser facsimile system and sent four floors down the building where a "laser mask", like a photographic negative, is made.

Ultraviolet light is shone through this on a steel sheet covered in semi-liquid plastic, hardening the plastic where it falls. The unhardened plastic is blown away with an air jet leaving a flexible printing plate that can be bent into cylindrical shape for the presses.

The facsimile process allows the pages to be sent by a private radio link to the New Jersey plant, which prints special sections for the Sunday edition and can also back up the Manhattan presses.

Classified ads use a separate system of four Interdata 70 minicomputers to process their text. Input can come from OCR, so the paper's 70 outside agencies can prepare ads themselves. On typewriters for direct input.

This has the added advantage of reducing errors, as does the elimination of compositors on the editorial side.

The New York Times' system is basically a Harris product, using their VDU's and software with

the new way: A journalist on the foreign news desk of the New York Times types in a story on one of 250 Harris 1740 VDUs.

they are a-changin'

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# Qume venture which became an empire

FOLLOWING generous exposure on BBC-TV's *Risk Business* programme this summer, the Qume success story is one of the best known in the computer industry.

Viewers learned how David Lee, designer of the Diablo daisy-wheel printer, saw his vital role go unrecognized when Xerox acquired Diablo; how he left to become the kingpin in a new company supported by venture capital investors, and was persuaded, rather against his inclinations, that the brand new product he should design was — a daisy-wheel printer.

The new company only went into the daisy-wheel printer business, and the burgeoning word processing market took it from a tiny company in 1975 to a \$54 million empire in the last

financial year, which closed in April. The company expects to more than double turnover this year, and with forecasts that the word-processing market will continue to grow at an annual 30-40 per cent per annum, and share logic systems growing at nearer 60 per cent, any slowdown in its main source of revenue looks a long way off.

Qume's success, of course, grew out of the fact that the only other source of daisy-wheel printers has been Diablo — and that company's parent is Xerox, itself a major competitor in the word processing business. Companies entering the business were disinclined to make a competitor a major supplier, and so Qume's reference list, including such names as Burroughs Redactron, AES-Wardplex, Vydec,

Lextron, Philips-Mycon, not to mention IBM — reads like a Who's Who of the business.

The most significant names outside the Qume camp are Xerox itself, and Wang, which uses the Diablo printer, and has now developed its own Xerographic printer for use with word processors (CW, August 24).

In meet demand for its printers, Qume doubled both the rates of production and the number of people employed over the past year, and plans to double sales again this year, although the rate of expansion of the workforce will begin to slow down. The company employs between 1,500 and 2,000 people and has formed Qume Cnric Inc in Puerto Rico to manufacture printwheels and

ribbons to supplement output from headquarters in Hayward, California.

Demand for Qume's products is still so great that deliveries are typically made 90 to 120 days after receipt of order, though additional capacity is bringing this closer to 60-90 days.

The Sprint 5 daisy-wheel printing terminal is being built for stock and will be available on 30 day delivery.

Qume is well aware of the potential risks involved in being a one product company and is investing over five per cent of its sales revenue in research and development.

Significant advances have been made in product design, notably the adoption of microelectronics, which makes maintenance much simpler. Boards can now be replaced without need for adjustment, where previously potentiometer circuits needed to be tuned in order to balance the servos each time a circuit board was exchanged.

Microelectronics allows more control of ribbon advance and hammer intensity and reduces the cost and complexity of the products.

Paper handling has been improved, new types of ribbon have been developed, and the variety of printwheels developed has grown steadily.

But Qume sees comparatively little further scope for major reductions in the cost of the product, and although it is constantly on the watch for new technologies which might offer comparable print quality to the daisy-wheel at a lower cost, there is nothing in sight. The

company acknowledges that it would face problems if anybody could refine matrix printer technology to produce daisy-wheel quality, but again, there are no signs that this will happen.

The Sprint 5 printer terminal does mark a mild departure for Qume, and further extensions of the technology are planned. The company is also likely to move into more loosely related electromechanical areas; it does, however, plan to enter the wet processor business on its own account, believing that it would be unwise to go into competition with its major customers.

The similarity of the Qume name to two Exxon office equipment companies Qyx and Qwh, and the fact that Exxon has a stake in Qume, has led people to suppose that the company is part of Exxon's global strategy. In fact, however, Exxon's stake in Qume is less than 10 per cent and the oil giant has no say in the running of the company.

One of the questions often asked about Qume is where it got its name. Apparently the founders commissioned a list of meaningless monosyllabic words, and Qume was the selected.

IN their enthusiasm to take advantage of the new techniques offered by distribution processing, how many computer users have actually paused to consider what precisely the term means?

For there is a real danger that in their eagerness to embrace the new concept, some users do not stop to consider whether what they are doing is really a new form of computing.

Consider the following examples. A distributor uses terminals, in his warehouses around the country, linked into a central computer to keep track of order levels and stock holdings. Is that distributed processing?

A manufacturer with regional offices in different parts of the country has a small business computer at each to handle its own invoicing. Aggregated summaries are then sent to head office for accounting purposes. Is that distributed processing?

Both examples use computers or terminal equipment in different geographical locations and both have seen the wisdom of not centralising their processing far away from the place where the work is actually carried out.

But I suggest that neither is a real distributed processing system, if we accept the criteria which I will describe. For I believe that geographical spread by itself, or the use of computing equipment in different locations, does not create a true distributed processing system.

Both examples are typical of a number of different activities in practise. For instance, one computer might automatically supply data to another. One computer might automatically carry out a task on behalf of another.

A small computer system might have the capacity to run programs but not store large files. If it could access files on a larger system automatically, that would be distributed processing.

This might involve any of a number of different activities in practise. For instance, one computer might automatically supply data to another. One computer might automatically carry out a task on behalf of another.

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# Ask the users at an early stage

THE concept of distributed data processing can hardly be called new; for a number of years now it has been evolving throughout the computer industry.

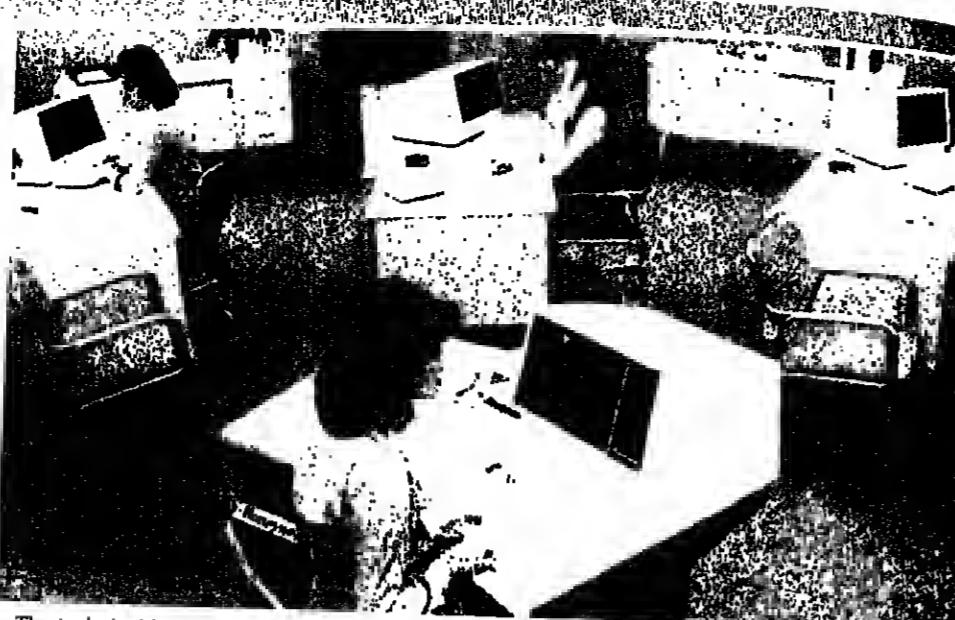
But what perhaps is new is the extent to which distributed data processing can now be developed beyond the realm of mere concept into the sphere of practical working systems.

Distributed data processing means different things to different people. Much has been written about it in recent years

and there has been much debate about the trend to this type of computing.

With a world-wide announcement last year, Honeywell took its distributed processing ideas a long way beyond pure concept, introducing a wide range of new equipment to give what it has called its DSE (distributed systems environment) philosophy the means of expression in practical system terms.

More recently, the Honeywell Level 00/DPS, distributed pro-



cessing system, range of computers was announced which encapsulates, at the central site, the further idea of distributing the processing power needed within the mainframe.

But never mind the supplier for the moment (although there's a big question to address in that direction later) let us look at distributed processing from the user's standpoint. Because any technique that doesn't start there will almost certainly start off on the wrong foot.

The technical limitations that previously forced users to place all their computer resources at a central site — and to adjust their business operations to meet the restrictions imposed by such centralisation — have for some time been giving way to a more flexible approach.

This is: allowing the user to distribute the power of the computer in ways that best suit the needs of his business, with as much, or as little centralisation as required.

Honeywell's DST 6/800 distributed system terminal (above) is a minicomputer-based system providing local processing, forms mode data entry, single pass forms creation, table look-up, data validation and editing, user programmable data entry validation and file transmission to and from a host computer system. Up to four video terminals can be used with each system.

distribution of hardware and software to an end-user organisation in the way that it serves the objectives of that organisation.

What this adds up to is that there are clear trends and needs in the marketplace — trends and needs not totally favouring either centralisation or decentralisation across the market spectrum but embracing an element of both in differing proportions.

That is to say, what users want above all is flexibility. They want the benefit of centralisation — large system price/performance, sophisticated operating system, improved security as well as multi-dimensional capability like transaction processing, file sharing and remote batch.

They also want the benefits of decentralisation such as dedicated processing power, file application programs, and computer operations and, through the use of intelligent terminals, small business systems and microcomputers.

A good case in point is the computing network which Allied Bakeries is implementing to give its 50 bakeries throughout the UK a greatly improved service and more decentralised control over their own operations.

The network will be based on a tandem Level 86 large-scale system and 44 Level 8 minis. It will provide flexibility in the hands of local management while retaining centrally the capacity necessary for the bulk processing associated with day-to-day production, sales and distribution of bread and bakery products across the country.

It was predominantly the time-critical nature of the baking industry that led Allied Bakeries towards this kind of distributed system which will be able to match production more accurately and more quickly to sales requirements, and give local bakeries the means for determining — and giving effect to — their own order of priorities.

Other users prefer even more distribution of processing power and applications using remote satellite computers; but they still want to maintain central control over programming and operations.

Again, some companies want to embark upon a completely new course: namely, total decentralisation with dedicated computers for dedicated applications.

This shift to remote locations extends right through to the end-user department, involving not only routine operations such as data entry, but also complete access to the computer facilities, including more sophisticated programming.

Users now expect computer power to be available to all levels and functions within their organisation.

This may manifest itself in the need for greater central system power and software capability, such as interactive languages, working from large central databases.

At other times it calls for the

failure.

DISTRIBUTED processing is computing of, for and by the people. It contains all the advantages of dispersing the mystique of computers but all the dangers of putting highly specialised equipment among non-specialist staff.

But once again the multiplicity can be used to advantage — failures can be accommodated by re-routing jobs past the critical point — so the advantage should be pointed out.

There is no reason why an intelligent terminal should be any less reliable than a non-intelligent variety. Its intelligence is based on semiconductors which have a proven record of reliability in computer components.

The service the user needs must be readily available. It's not going to get clogged up with his staff aren't going to be sitting for hours in front of a VDU waiting for answers.

Now distributed processing gives the computer manager the opportunity to demonstrate that the beast is friendly: each department can hold a paw — or, to be more precise, a remote job entry terminal — without getting bitten.

All of which is good public relations as long as it works properly — as long as the non-skilled user can handle his terminal without difficulty and obtain his results effectively.

Not only must the system be easy to use, it must be seen to be easy to use. So, the format and sequence of commands to be used should be natural, easy to learn and easy to remember.

This modularity is much more achievable in a distributed computing system than it is in a centralised one, always given that the interfaces and protocols used between different pieces of equipment are standardised.

A centralised computer system tends to be monolithic, if only because it all comes from the same manufacturer or from plug compatible alternatives (which is pretty much the same thing). The variety of equipment in a distributed processing system must make it modular in design.

The user must see that the equipment he uses can be maintained with minimum disruption to his routine. Automatic self-diagnostic hardware and software and the use of remote diagnostics through a network are the best way to ensure that problems are

stand alone business applications

which the data processing manager can now offer his company as a cost effective addition to distributed processing.

Four-Phase Systems, at the forefront of technology, has studied the problems of modern business and produced a family of video oriented computers to give the data processing manager the maximum flexibility in systems design.

VISION is a distributed processing package for use with Four-Phase clustered display systems. It combines Key-to-Disc, Source Date Entry, On-line Enquiry, Local Date Management, Report and Document Generation and Batch Communications with an optimum balance of local and central processing.

ForeWord is the word processing package

for use with Four-Phase clustered display systems. It combines Key-to-Disc, Source Date Entry, On-line Enquiry, Local Date Management, Report and Document Generation and Batch Communications with an optimum balance of local and central processing.

It is a good question — anyone that would do well to ask at an early stage.

# Chance to show 'Beast' is friendly

By Dennis Papworth



Distributed processing is one way that the traditional snobbery between user and DP manager can be broken down.

Yes, the user can even shake paws (remote job entry terminals) with the beast without getting bitten.

Dennis Papworth, sales manager for Gemma Associates, describes what users should want from a distributed system. He concludes by urging that designers should orientate the system towards non-technical users.

and thus obviate the need to transmit large volumes of data at frequent intervals.

Finally, the design of the system must be oriented towards non-technical users. At the conference on future systems last year, an independent consultant laid down four basic design rules for anyone thinking about installing a distributed processing system in their organisation: the rules stressed that distributed processing is for ordinary

people.

According to him, local processing power must not mean local specialist data processing staff and all technical implementation must be performed or controlled by the central computer department.

Also, data capture must be near to the origin of data as possible and specialist data processing staff should not intervene in the internal distribution of data.

## COMPUTER WEEKLY/IDPM WORKSHOP

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Present

# Successful User Relations

A PRACTICAL WORKSHOP ON EFFECTIVE COMMUNICATION BETWEEN THE DATA PROCESSING DEPARTMENT AND THE USERS

Tuesday, October 17, 1978, at the Holiday Inn, London

Because DP is a service function, it depends on its users for ultimate success. But users from the Board to the shop floor differ in needs and outlooks and as they grow in power and numbers their attitudes can make or break the fortunes of DP.

This practical workshop, to be run by Nigel Laure, director of communications audit, will help delegates to discover the techniques and approaches that work best in helping successful user relations. The workshop is practical and based on experience. Above all it is participative so that delegates can put theory into practice. A summary of a survey

conducted at a previous Nigel Laure workshop on this subject was published in Computer Weekly on May 25.

For this latest workshop the number of participants will be limited in order that the maximum benefit may be achieved. If you would like to reserve a place please complete the application form and return it to the address shown, not to Computer Weekly or the IDPM. A brochure giving further information about the workshop may be had from Tony Swain, BIT, 40 Bowring Green Lane, London EC1 ONE. Tel: 01-837 3628.

To Conference Administrator, IPC Business and Industrial Training, Surrey House, Thirroul Way, Sutton, Surrey SM1 4GD. Telephone: 01-643 6040.

Please reserve... places for the Successful User Relations Workshop to be held at the Holiday Inn, George Street, London on Tuesday, October 17, 1978. The fee is £20 (plus VAT £4) for members of the IDPM; £16.50 (plus VAT £3.30) for non-members. Cover attendance at the workshop, coffee and tea and full course documentation.

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Are you a member of the IDPM?



## The key is an evolving one

From page 18

that gives the user considerably more flexibility in meeting his own requirements.

They also call for a true distributed system capable of common database, common protocol, expanded transaction processing and full compatibility among system components.

These then are the kinds of needs that have to be met by computer companies if they are going to make distributed data processing meet anything more than a grand concept.

Honeywell sees the key to the problem as "evolution". It believes that, if a computer supplier is to move with its customer's into the kind of distributed systems environment that will answer their future

requirements, then the course to take becomes very clear.

It means evolving with the user.

## stand alone business applications

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It is a good question — anyone that would do well to ask at an early stage.

## Key-to-disc/remote job entry

which the data processing manager can now offer his company as a cost effective addition to distributed processing.

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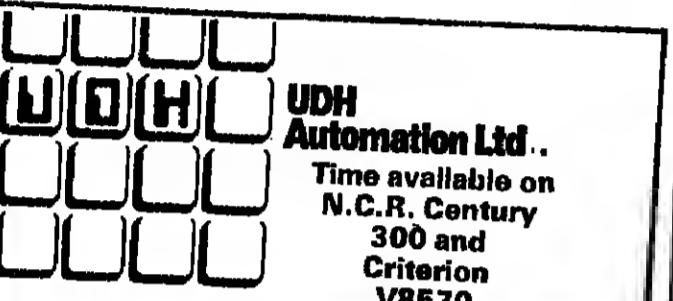
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# Pilgrim's progress up the Motorway

By Peregrine Butler

If you ask a Southerner where Manchester is, you're likely to get this reply: "Manchester? Yes, well, it's a jolly long way up the M1." And there the conversation will terminate.

This applies to the North in general. Everyone has a vague notion of its whereabouts but no one is sufficiently well-informed to give you more accurate directions.

Southerners have all heard of Wales because they have friends who own weekend retreats there, but the North is in some dismal abyss beyond — never to be visited, until like some using out of Pilgrim's Pro-

gress. It's a pity that Southerners are so sceptical. In my experience, the North has more to offer than the South, something you will be made well aware of as you read this article.

To start with, there are the people — warm and friendly with always five minutes to spare. Not because they have nothing

better to do, but you might say it's just a natural courtesy to chat, and find out a little more about one's fellow man (in habit which, I have noticed, the people in the South certainly do not possess).

The North is liberally sprinkled with excellent shopping centres in beautiful historic towns and cities such as Chester, Harrogate and York. Of course, getting to any of these places is no problem whatsoever, as the North has the best motorway network in the United Kingdom, linking every city, airport and major town.

The Northerners take their social life very seriously, so we find scattered throughout the North some of the best night-clubs in the United Kingdom.

For the gourmets too, there are superb restaurants, admittedly not as concentrated as in the South, but certainly worth the journey. (Two recent

winners of the Egon Ronay Best Restaurant of the Year Award survive in Kelsley and Ilkley in Yorkshire.)

For those who enjoy a well-brewed pint, there are many delightful and Picturesque pubs to be visited, with real ale at only 27 p per pint.

The North is certainly not for weight watchers!

For the businessman, Manchester, as the commercial centre for the North, has every facility to be wished for, including fast train links with London (approximately 2½ hours), and regular flights connecting with every other major city in the United Kingdom, and with Europe.

For the computer professionals in the North, there is everything and more. It is possible to divide the ad-

vantages of living and working in the North into three categories: domestic, social (which we have already covered), and career opportunities.

First of all, I'll take the domestic side for either a single or a married person. The main thing that springs to mind is property. It is possible to buy a terrace house in a beautiful village for as little as £3,000. Or the budding DP manager can buy a detached house in its own grounds for around £23,000. There are no problems or waiting lists for people who want to buy property in the North. (Just think, your house in the South could buy you something of around twice the size in the North!)

As a lot of these installations are now they carry most up-to-date and sophisticated hardware and software, therefore it must be obvious that career potential is enormous.

In recruiting for Northern clients, we find that most companies offer very generous relocation ex-

periences from the South. Salaries tend to be very competitive; in some cases more than you would expect to earn in the South of England.

All the larger companies

and the majority of smaller companies, rely on service organisations such as our own for both contract and permanent staff requirements. We are very much used as a consultancy, and that there is a more varied selection of work. This really means that the computer professional can select the job that suits him best, rather than accept the job that he may have to take in the South.

Still, anybody who reads

the computer press regularly will know that there are a vast number of openings in the North of England, and that the range of career opportunities are too numerous to mention in this article. Let me just remind you that the more relaxed pace of life in the North lends itself to a more satisfying working environment.

CW 1978

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On an IBM 370 using PL/I, structured programming, MVS/VSE, IMS/VSE.

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For details of these and other contacts please contact Perry Butler 143/144 Hope Street, Manchester, Telephone No. 061-233 9244/3. Midlands: 021-238 1794.

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The J O Williams group of direct mail order companies located in central Manchester is in the process of redesigning a complex integrated system. The installation is based upon an IBM 370/148 with extensive use of on-line facilities. The position will involve in-depth discussions with the user departments, writing of detailed program specifications which are all embodied in including accounts, stock control, financial control and marketing analysis.

You will be 21+ with a minimum of two years' experience of IBM equipment. Ideally, you will have programming experience, whilst being useful, is not essential as full training is offered. Therefore this could represent an exceptional opportunity for programmers who wish to further their career into Systems Analysis.

A salary negotiable up to £5500 plus 4 weeks' annual holiday and a staff discount scheme combine to make this a very attractive package, which also includes relocation expenses if appropriate.

CW 1978

### PRESTON

#### 1 PROGRAMMER

Salary c. £4600

#### 2 SYSTEMS ANALYSTS

Salary c. £5600

Our Client, a market leader in the Leisure Industry, is shortly to upgrade its mainframe to an ICL 1904S and introduce a free-standing Burroughs 1825.

They now require a PROGRAMMER with at least 2 years' COBOL experience, preferably gained on Burroughs equipment and 2 SYSTEMS ANALYSTS with approximately 4 years' experience to join flexible project teams engaged on a series of exciting applications including on-line Stock Control, Order Processing and Financial Systems. Burroughs experience and communications knowledge will be a distinct advantage.

The Company is working a 4-shift system and planned future expansion of the installation offers excellent prospects of promotion together with normal benefits offered by a large company.

Assistance will be given with relocation where necessary.

CW 2978

### LIVERPOOL

#### 4/5 OPERATORS

Basic Salary £3000 + 33% Shift Premium

Due to continued expansion and resulting promotions, this client now seeks Operators with approximately 2 years' experience to join flexible project teams engaged on a series of exciting applications including on-line Stock Control, Order Processing and Financial Systems. Burroughs experience and communications knowledge will be a distinct advantage.

The Company offers excellent prospects for personal progression and is situated in a brand new purpose built office block. Assistance will be given with relocation where necessary.

Ref. CW 4978

### MANCHESTER

#### TRAINEE OR JUNIOR SYSTEMS ANALYST

Salary c. £4500

An opportunity has arisen within a progressive O.P. organisation for a Trainee or Junior Analyst. The qualities that our client is looking for is a self-motivated person with essentially a programming background. Systems Analysis experience, whilst being useful, is not essential as full training is offered. Therefore this could represent an exceptional opportunity for programmers who wish to further their career into Systems Analysis.

In return, the company offers a realistic career path stimulating projects end scope to progress into on-line applications.

Ref. CW 3978

### MANCHESTER

#### New ICL 2903 Installation

1 Analyst/Programmer, 1 Programmer, 1 Operator

Our client currently uses bureau facilities and now plan to bring the D.P. function in-house based on an ICL 2903. They now require an Analyst/Programmer with approximately 2 years' commercial experience of financial systems and a Programmer, both with around 12 months' COBOL experience. RPG II would be an added advantage. The operator will have experience of dice based systems.

Competitive salaries together with an opportunity to join a new installation at the outset makes this an opportunity not to miss.

Ref. CW 5978

### LIVERPOOL & MANCHESTER

#### PROGRAMMERS

Salary up to £5350 + Benefits

SENIOR PROGRAMMERS

ANALYST PROGRAMMERS

Salary up to £6000 + Benefits

Our client has vacancies based in Manchester and Liverpool for experienced computer staff at all levels. Opportunities exist on development work with both minis and mainframes. Specific expertise is less important than a high degree of competence and conscientiousness, as the Client has a committed policy of ongoing staff training.

The company offers excellent opportunities for career development based on personnel performance, and there are occasional opportunities for travel.

Ref. CW 6978

#### SENIOR ANALYSTS & PROGRAMMERS

£6,000 - £6,600

MERSEYSIDE

REF: LL 78111

A systems or programming background of three to four years or more could gain you senior status in our client's IBM 370 installation. COBOL is the main language and there is a mixture of batch and on-line database work. Plans are in hand for distributed processing. A flexitime scheme is operated. Holidays are 4+ weeks. Relocation assistance is available.

Training will be given.

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Systems Analysts with an ability to communicate to work as LECTURERS.

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Ref. LL 78105

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LANCASHIRE

REF: LL 78102

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Salary will be negotiable according to experience and qualifications. A generous range of benefits include assistance with re-location where appropriate.

To find out more simply ring Len Cray (Reversing Charges) on LEEDS (0532) 444185. Alternatively write with brief career details quoting Ref: CW12, to Lorien Computer Services Limited, FREEPOST, LEEDS LS7 3YY (No stamp required)

## BUSINESS ANALYST POSITIONS—MERSEYSIDE

A major user of advanced DP systems throughout the company has a requirement for additional business analysts at several levels of experience. The company currently operates the latest large computer hardware with satellite mini-computers. Future hardware plans are extensive.

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You will be responsible for a small team of business analysts and interface with technical and line management personnel. You may expect to work on a variety of projects and gain a broad understanding of our client's business.

### RESPONSIBILITIES

To help develop viable systems from feasibility through to post implementation review.

### REQUIREMENTS

Candidates must have a good academic record and several years' systems development experience in a large company environment. An all round appreciation of business situations is also essential.

REF: CW15  
In all cases our client offers an attractive benefits package with full relocation if required. Initial interview will be held in Leeds, Liverpool and London to suit applicants. To find out more simply ring LEN CRAY (reversing the charges) on LEEDS (0532) 444185. Alternatively, write with career details to quote Ref: CW15, to Lorien Computer Services Limited, FREEPOST, LEEDS LS7 3YY (no stamp required).

## LORIEN COMPUTER SERVICES



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A continuous training programme is in operation designed to make the most of your potential. Attractive careers exist with our client for those wishing to remain in programming whilst the route to analysis is open to all.

### INTERESTED?

If you have COBOL experience to date then ring IRENE ROGERS on Leeds 444185 to find out more about these very attractive vacancies. Alternatively, write with brief career details quoting Ref: CW14, to Lorien Computer Services Limited, Freepost, Leeds LS7 3YY. (No stamp is required).

# FERODO

## SENIOR SYSTEMS ANALYSTS

### THE COMPANY

Ferranti Limited is based in the Park, Farnworth, and has a number of sites with relatively low-level training within commuting distance of both Shalford and Manchester. We are one of the country's leading manufacturers of traction equipment - following initial procurement and development of over projects - are currently seeking Senior System Analysts to join us at our Head Office.

### OUR COMPUTER

Ferranti Limited is part of the Turner and Newall Group and is one of the unit companies using a system located at 01204 158 running under OS-VS and using MVS. We are shortly upgrading to DVS. Some of our systems are still running on our locally based ICL 19627 but those are rapidly being transferred to the central IBM machine.

### THE JOB

The successful applicants will be involved in new developments concerning Factory Loading, Process Control, On-line Order Processing and Group Accounting Systems which will include an on-line Sales Ledger. Full training will be given where necessary.

### THE APPLICANTS

The job calls for 2-3 years' experience and achievement in commercial systems analysis, design, development and implementation. Educational requirements are qualifications at 'A' level standard or equivalent and preferably a degree.

We offer Competitive Salaries according to experience and suitability and the benefits package includes membership of the excellent Turner and Newall pension scheme, free BUPA membership, four weeks' holiday assistance with relocation expenses etc.

We work a 5-day 37-hour week - 8.35 a.m. to 4.30 p.m.

To find out more about this job, telephone our Systems and Programming Manager Brian Smith, on 029-881 2520, ext. 320, or alternatively, write for an application form to:

The Personnel Manager, John Crowson, Ferodo Ltd., Chepstow-on-Teifi, nr. Stockport SK12 6JP



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An opportunity now exists to join Cummins Engine Company Limited, one of the World's leading manufacturers of high-speed diesel engines as a Systems Analyst.

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Conditions of employment including salary are those expected by a major international company and include flexible working hours, 23 days' vacation, free life assurance and relocation assistance to this attractive part of the North East.

Applications, enclosing a detailed c.v. should be addressed to:  
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Personnel Supervisor



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The company believes in promotion from within, and technical staff can reach the very highest management levels in the company, which depend upon its technical expertise to remain on the forefront of technology.

### The job

The role of the customer support programmer involves the following main activities:

- \* Operating system building and testing. This is a combination of product development and quality assurance, and real scope exists for original and creative work.
- \* Software installation on-site, giving opportunities for short visits in the UK and overseas.
- \* Problem solving.

The 'therapies' of the business, requiring diagnostic flair, and the ability to work under pressure, ideas for operating system improvement are often generated here.

If you have these attributes, the company will pay you well, and will give you every opportunity to progress. The rest is up to you. The offices are located on the South side of Manchester, in pleasant and rural surroundings. Assistance with relocation is available where necessary, and the usual large company benefits apply.

Please apply to Sampson Stoll in the first instance, either by telephone (transfer charges if necessary), or letter. Initial interviews will be held in Manchester or London.

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COBOL Programmer with about 2 years commercial experience required to join a well established in-house installation. Excellent career prospects.

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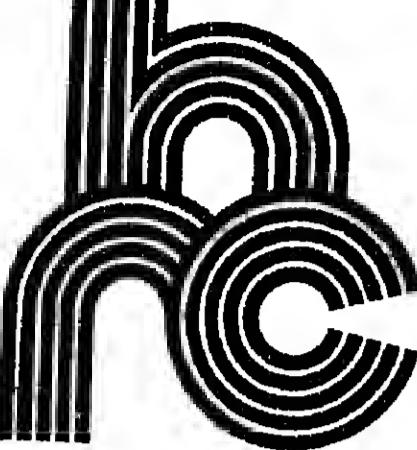
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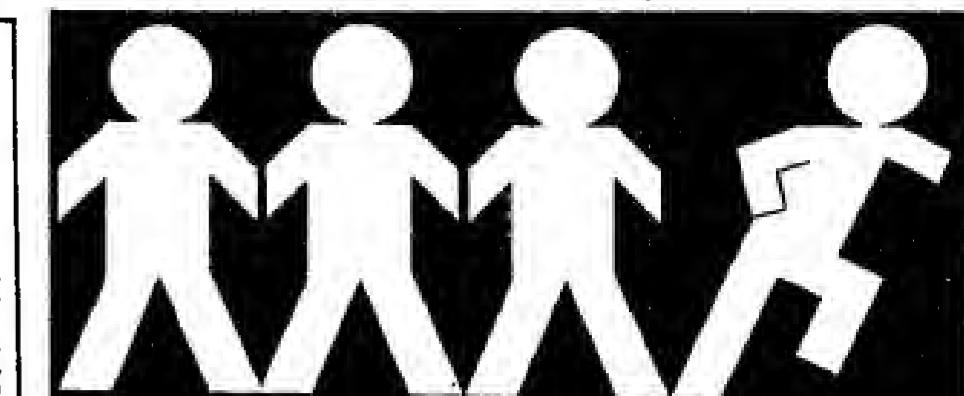
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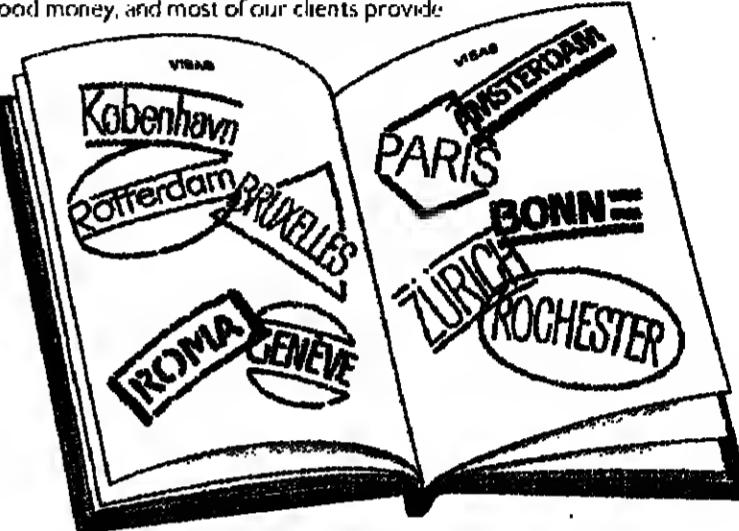
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Please contact Richard Kaluzynski on  
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# William Key

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(Ref: JDH1) Jenny Dalrymple-Hay, Beaconsfield (04946) 4579 (Home)

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Jacqui Thomas, 01-979 3550 (Home)

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SE England      to £7,000

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Telephone 01-493 2947  
504/8 Corn Exchange Corporation Street  
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# William Key

COMPUTER WEEKLY, September 21, 1978

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## AMERSHAM, BUCKS

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You will need around 3-4 years experience, preferably on IBM equipment, and you should ideally also have a programming background.

Our client has attractive offices and is offering excellent fringe benefits together with a realistic salary.

Jacqui Thomas, 01-979 3550 (Home)

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to £6,000

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Liz Segal 061 928 5495 (Home)

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(Ref: JDH5) Jenny Dalrymple-Hay, Beaconsfield (04946) 4579 (Home)

## HOLLAND

£10-£16,000 equivalent + car, etc.

### MICRO COMPUTER SPECIALISTS

Our client is looking for Micro Computer Specialists who must have a minimum of two years' practical micro experience. The projects are software biased, though a hardware background could be an advantage as would automotive experience. The work will cover, for example, machine control, video control, special products, and many of the systems are being developed on a total turnkey basis.

(Ref: JDH6) Jenny Dalrymple-Hay, Beaconsfield (04946) 4579 (Home)

## EUROPE

Dutch based      To £15,000 equivalent + car and perks

### MUMPS Designers and Programmers

Designers and Programmers with MUMPS applications experience are required for the development of medical, technical, and business systems in Holland and elsewhere in Europe. Applicants must have some MUMPS experience but an ANS MUMPS course will be provided.

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## Software and Communications Specialist

Salary to £9000 + Car

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We are looking for a person who wishes to remain in a technical environment and utilise his/her skills in a sophisticated computing installation.

The position is based in West London with an International Company. A consultancy Division has recently been established to cater for the Group's corporate needs. This includes all computing services.

The installation has a DEC 20/40 with Wang terminals. DEC's database management system is used with supporting online and distributed processing for a European network. The Wang systems are used at two levels: at remote sites catering for local requirements, and additionally as front-end processors online to the mainframe in London.

We would like to meet someone with sound knowledge of online and real-time networks. Familiarity with DEC and/or Wang equipment (or similar) is desirable, plus in-depth programming and systems software experience.

For further information please telephone Corinne Ingram on 01-828 5356, or forward a copy of your résumé in confidence quoting Ref. 1934-CW.

Responsibilities include:  
—implementation and maintenance of systems on the DEC and Wang equipment  
—writing software for both minicomputers and mainframe  
—keeping abreast of local transmission requirements and updating data transmission software as necessary  
—administration and maintenance of the database  
—monitoring system performance and making recommendations for improvements as required  
—liaising with other members of the Consultancy Division and advising on technical aspects of communications and operating systems software.  
It is envisaged that future responsibilities will also include supervision of programming staff.

The European sites, which include Spain, France, Greece and Switzerland will need direct support and applicants must be prepared to travel overseas for short periods of time. An understanding of French or Italian would be helpful.

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Please contact GEOFF MARSH on 01-499 4501 (24-hour answering service)

Ref. RW 38/1

# CONTRACTS

## RPG2/CICS/SYS 3 Production Control

Long term — Belgium  
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On-line Various locations UK

## IBM Cobol

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NW London — now

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for more details of contracts with Hutchinson Scoggins Contracts Ltd,  
other parts of the UK (and occasionally Continental Europe) will sometimes

Ref. RW 38/3

# TRAINING OPPORTUNITIES

Systems - Programming - Engineering

£4,000 - £8,000

One of the most rewarding jobs that can be done in British Industry today is to impart much needed skills to people new to computing or becoming involved (as customers or employees) with the more sophisticated techniques and systems. It is a job that will stretch your resourcefulness and ability, but repay you amply in job satisfaction — not to mention the paypacket!

These opportunities are with the Training Division of a world-renowned careers. You will have access to the most modern of techniques and resources, and to facilitate for your own personal improvement and development.

All positions are based to the West of London, although lecturing assignments in other parts of the UK (and occasionally Continental Europe) will sometimes arise.

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Ref. RW 38/4

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Ref. RW 38/2

# KENT ANALYSTS AND PROGRAMMERS THIS COULD BE YOU! — AT CHARTER CONSOLIDATED



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- ★ Increased my salary substantially
- ★ Had sole responsibility for a multi-national engineering cost control project
- ★ Travelled to Zambia on systems duties



I'm MIKE — In 20 months at Charter

I have:

- ★ Been promoted
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- ★ And I shall shortly be travelling to Luxembourg on programming duties

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# IBM COBOL Programmers

Kent/London minimum of £6,500 Our London based client is a recently established software house, which already has a number of major contracts. The long term aim is to move into software development for which plans include the installation of a PDP 11 minicomputer.

The immediate requirement is for COBOL programmers, with a minimum of eighteen months IBM experience, to join their project team in Kent. Extremely generous salary packages are offered, with additional help available for relocation. Minimum basic salaries will be £5,000 p.a., plus bonuses and profit share amounting to approx £1,500. More senior individuals can expect much greater rewards.

Contact: Jim Baker

A phenomenal chance to be in at the start of what promises to be an extremely successful venture.

Contact: Andy Wright

JBA

## Communications Specialist

London £8,000 + car

A newly formed computer function within an international group wish to appoint a Communications and Software Specialist to develop a European network based on a DEC 20 system.

Ideally the candidate will have a combination of experience with commercial systems development, selecting and modifying manufacturer software and design/implementation of a distributed network. Although this is a senior position, the job will involve a high degree of technical work, particularly in the initial stages.

Knowledge of one or more European languages would be an asset.

Generous salary and fringe benefits.

Contact: Jim Baker

A phenomenal chance to be in at the start of what promises to be an extremely successful venture.

Contact: Andy Wright

Consultants

## Information Retrieval Systems

London based up to £8,000

One of the UK's most established consultancies wish to appoint consultants with experience of computer information retrieval systems. The company is looking for technicians with a computer background but who have been involved in the implementation of a system in a library or documentation centre. Candidates should have some knowledge of at least one proprietary package in the field, such as, STAIRS, STATUS, DIALOG, ASSASSIN or ORBIT. Applicants will be expected to have the personality and communications skills to carry out client projects without detailed supervision. They should also be able to contribute to the continuing development and marketing of packages and services in this area. This is an opportunity to join a stimulating company with variety of work and good staff benefits.

Contact: Margaret Stevens

## Trainee Product Specialist

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Backed by a parent company in the USA, their growth has been tremendous, so there is a good deal of scope for individual career development — around £6K + car can be expected within eighteen months to two years.

An ideal opportunity for a graduate with about 1 year's experience of Assembler, preferably on mini or micro.

Contact: Andy Wright

For further information on any of the above vacancies please contact the appropriate consultant.

If your qualifications do not match the above positions but you're seeking other opportunities please contact us anyway.

Contact: Margaret Stevens

circa \$29,500

We are seeking a number of systems analysts to undertake a project in the USA for a period of up to 18 months. The client is an international banking organization based in New York.

Candidates must have direct experience of foreign exchange systems, plus general banking and financial knowledge. The system will be implemented on large IBM 370 equipment.

Interviews will be held in London and visas will be arranged for the successful candidates without delay.

Contact: Mike Creamer

**JAMES BAKER ASSOCIATES, International Personnel Consultants**  
16 Maddox Street, London W1. Tel: 01-491 4478



Data Processing Recruitment Consultants

## Mark IV or IMS Washington, E.E.C., Scotland, London

Salary: \$30,000 + + (U.S.), £15K + (E.E.C.)

A prestige Multinational U.S. client require for their Washington office Mark IV programmers with at least two years experience. This position is permanent and the appropriate VISA will be applied for by the company. Additionally our client seeks IMS (DB/DC) programmers, Analyst Programmers and Systems Designers for their Swedish, London and Scottish offices. In particular they require applications

specialists and one or two IMS internal Systems Programmers familiar with performance and prediction standards. Successful candidates are likely to be either graduates or have a very extensive solid background in advanced computer applications and should preferably be available by November. Interviews will be held in London early October.

Ref. 25A

## Mini + Main-Frame Programmers Manchester + London

Salary: £6 - 9.5K

Our client is a major international company recognised as market leaders in their field and has retained Logistix to assist in recruiting the following key project team specialists: Real-time mini programmers, Data base designers, compiler specialists, communications experts (Mini and Mainframe), Application and Software programmers. Experience of any of the following will be especially welcome: RSX-11, RTI-11, BASIC, ASSEMBLER, PL/I, COBOL, IMS and

D.B. For those who enjoy overseas travel there will be ample opportunity to visit European and Middle East locations at which our clients have offices. Successful applicants are likely to demonstrate qualities of leadership potential, determination and be self-starters. It is anticipated that you will achieve very rapid promotion within this prestigious company. Interviews will be held as soon as possible and offers will be made within 1 week of interview.

Ref. 26B

## Message Switching + Communications London, H. Counties or E.E.C.

Salaries: £6.5 - 11K

A prestige International Client is seeking to expand and establish new project teams working on wide and varied applications areas with emphasis on Data Communications. Message Switching and Mini Software. Can you picture yourself working in the forefront of mini systems applications and software development? Become a member of one of numerous specialist project teams in which you will make a valuable contribution whilst at the same time expanding your own frontiers of knowledge and experience. This is a unique opportunity to enhance your career by extending your horizons and developing skills.

of-the-Art D.P. technology. Successful candidates are likely to be either graduates (Computer Science or Maths) or have a very solid background in advanced computer applications and are probably aged between 23 and 33. You are presently likely to be either a Systems Designer/Consultant, Analysis Programmer or a programmer in a Mini computer environment with extensive Assembler experience. Any specialist expertise in the areas of Data communications, Message switching, computer networks, Processor control or Mini computer software will be considered particularly advantageous.

Ref. 26C

## IMS + Database Germany + London

Salaries: Germany £15K +, London £7K +

One of the World's foremost Software Specialist Groups (not body shop) with HQ in the U.S. have asked Logistix to identify top calibre IMS programmers up to Team Leader level and beyond, for permanent positions in Germany and London with the option to transfer for limited or extended period to the U.S. Suitable applicants must have current IMS (DB or DC) applications or systems programming experience using COBOL, PL/I, or BAL with DB/DC. It is anticipated that candidates will have worked

with IMS applications for 2 years or longer. Applications cover on-line enquiry systems, banking, sales ordering, stock/inventory control, budgeting and forecasting etc. The scope of projects and the prestige of working with this acclaimed Market Leader will be certain to appeal to the most demanding career minded individuals. The high salaries reflect the prominence which our personnel who are certain to rise rapidly to Consultancy or Management levels.

Ref. 26D

## PL/1 Programmers City of London

Salary: not less than £6K up to 9K Plus Mortgage

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member of a specialist project team under strict documentation and programming standards. A second language (COBOL or Assembler) would in addition be considered advantageous. Our client offers a 2½% subsidised mortgage, personal loan scheme, private health and a non-contributory pension plan. Interviews will be held in London during the next 3 weeks.

Ref. 26E

Logistix, Freepost 32, London W1E 3YZ  
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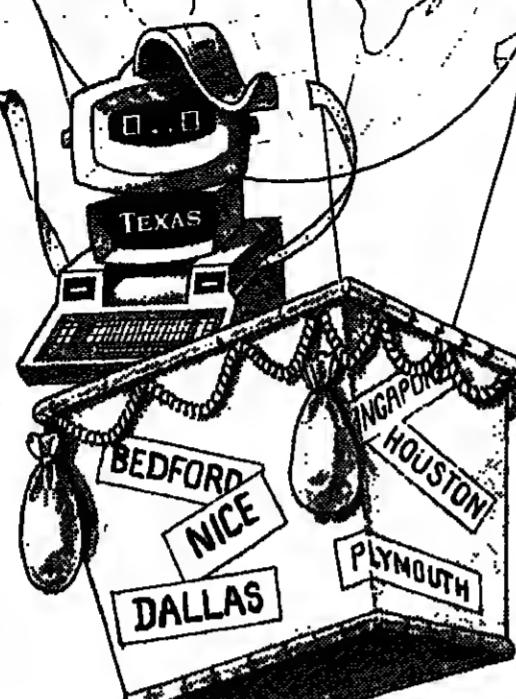
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**PROGRAMMABLE CONTROL SYSTEMS**

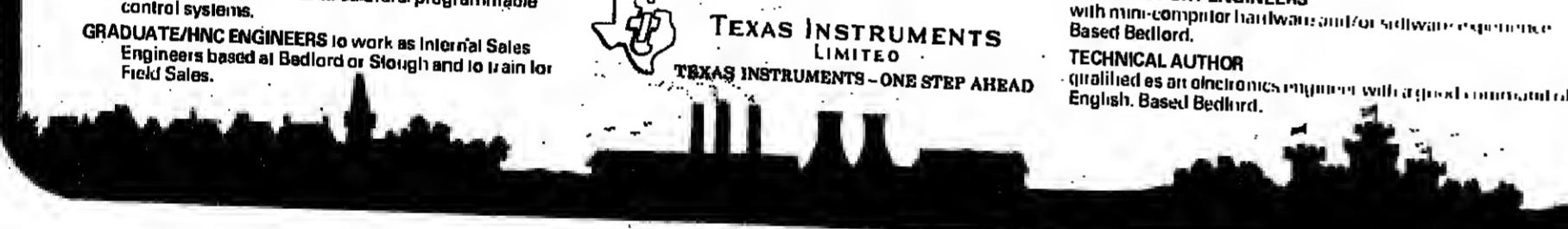
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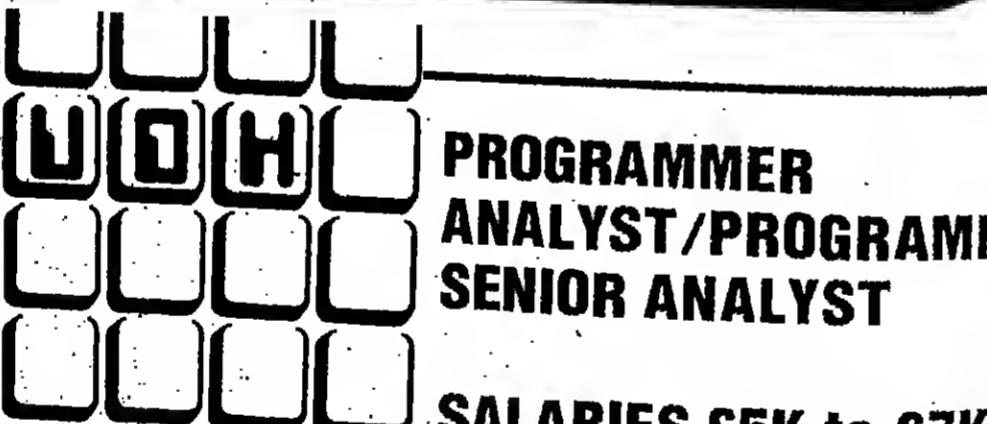
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### Glynwed Group Services

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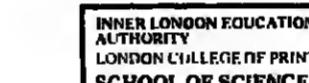
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TECHNICAL AND MANAGEMENT COMPUTING AND MANAGEMENT SYSTEM GROUP

### Programmers

£3,732-£4,632 (inclusive) 2 posts

1. FORTRESS  
2. COBOL, FILETAC

The computing group provides a technical advisory and programming service to both the engineering and management staff of the Department which has a wide range of computer facilities, including a remote batch terminal, teletypes, programmable calculators and electronic card punches. Considerable work is made at the County's own 19045 computer, which is to be replaced by 2900 series early in 1979 and also of computer bureaux.

Two programmers are required, one familiar with FORTRESS and/or COBOL, to provide support with a full range of support in the field of logic and structural design, the other preferably conversant in COBOL and/or FILETAC to assist systems analysts developing information systems including the use of database techniques.

Essential qualifications are a formal education to 'A' level standard and a minimum of 2 years' programming experience plus knowledge in data processing.

### Technical Assistant

£1,821-£3,661 (inclusive)

To assist with data preparation, terminal operating, program running and many other technical and administrative aspects of day-to-day work.

Applicants must have O level education, be well organised and be able to work to high standards. Some experience of computer operation would be an advantage.

For further details, phone John Hanney, Maidstone (0622) 671411 (ext 3756).

Job description and application form returnable by 6 October from the Personnel Officer, Highways and Transporter Department, Kami House, Inver Stone Street, Maidstone (please quote ref. P4280).

### COMPUTER ENGINEERS

FOR THE WEST COUNTRY

Western Accounting Systems — A rapidly expanding computer sales company require experienced field service engineers able to repair to chip level and maintain their range of Disc based Mini Computers at customers locations around the West Country. If you feel that you have the experience which we are looking for then please contact either Richard Gaigie or Roger Ford on 0934-416398 or write to:

WESTERN ACCOUNTING SYSTEMS LTD.  
4 Wallcote Road  
Weston-super-Mare, Avon

### SENIOR PROGRAMMER

Salary up to £7,230 per annum

CAN YOU HANDLE AN ON-LINE SYSTEM?

Thames Valley Police are looking for an experienced Senior Programmer to perform development and maintenance work on a computer on-line system. A challenging series of extensions to this system and its associated IDS batch programmes is envisaged.

The successful applicant will have extensive COBOL experience on an on-line system, preferably but not exclusively on Honeywell 6000/level 66 using IDS & TDS. He/she must be willing to take an increasing interest in the maintenance of existing software and develop the ability to communicate at all levels.

Over 6 weeks' holiday, pension scheme, assistance towards removal expenses.

Application form and further particulars from: Personnel Officer, Thames Valley Police, 14343 ext 261.

# 'People who work in RPG II should not become nursemaids'



### [Altergo Business Systems. 1st Career Principle].

Working on one installation for one user, that's just what happens, right? You put all your skill in and once the system's set up there's not much left to stretch your ability. Time, perhaps, to move to a more demanding situation which never lets up on you:

We're an autonomous company within Altergo, the most professional software group in this and thirty other countries. We're young, aggressive and talented — established as the specialist leaders in RPG II in a relatively short time — and we're looking for analysts and programmers who think they can match our reputation.

Tedium is one thing that's not part of our career plan for you. For a start you'd be handling projects no less than every nine months. Which means a lot of different problems, on constantly varied applications in different industries.

Then there's equipment. We want people experienced in hardware extending from IBM 13234 to system 3 Model 15D and we can promise you the most contemporary hardware available. And finally, your commercial prospects. Leaders we may be, but we've only just started towards our long term aim. Join us and we'll be asking for an enthusiastic commitment to a policy which seeks out and recognises individual achievement. Within the structure,

there's no limit to where you can go. Geographically, you could stay in your general location or travel far and wide. Either way you'll be well paid.

Come and talk to us if you have ambition and you want career scope. Contact Barry Whiteside on 01-734 9681 for interviews in London, Birmingham or Manchester. Or write to him at: Altergo Business Systems Limited, Warwick House, 38 Soho Square, London W1.

**altergo**

### SALES EXECUTIVE 10K + VOLVO CAR

This dynamic American Company has opened an office west of London and is looking for 2 young salesmen to spearhead its approach on the U.K. market.

Whilst experience of IBM Mainframe (or PCP) equipment would be a distinct advantage, candidates with a successful sales record in the field would be actively considered.

If you can meet this demanding yet rewarding challenge, contact Terry Welch, Technical Support Manager, or

### SUPPORT SPECIALIST

c £6,780 + car

Frequent travel to Europe and Florida, U.S.A. At least 3 years' Assembly required, previous experience in trouble-shooting of real-time systems, or typesetting/word processing background would be desirable.

If you can meet this demanding yet rewarding challenge, contact Terry Welch, Technical Support Manager, or

E. M. Grant Scarfe, Personnel Manager  
Harris Systems Limited  
146 Farnham Road, Slough, Berks. SL1 4XD  
Slough 34666

KEY COMPUTER PERSONNEL  
01 949 3140

### MEMO



To TRAINING OFFICERS  
Subject CORAL 66 COURSES \*

The next Systems Designers CORAL 66 training course is on

\* 30th October in Farnborough Hants.

Cost: £210 - Residential: £313

One week intensive course produces effective CORAL programmers through the use of proven, worked examples.

Course organisers are premier suppliers of CORAL 66 compilers to industry.

Details from Corinne Rixon  
Systems Designers Limited  
Systems House, Pembroke Broadway, Camberley,  
Surrey. Telephone Camberley (0276) 62244.

### MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

#### OPPORTUNITIES IN THE CITY . . . TO £8,000

Our client is a successful computer bureau offering a wide range of services primarily to the investment community with its own top class professionals to cope with their rapid growth. Immediate plans include the upgrade of the mainframe hardware from IBM 370-148 and considerable enhancement of TP facilities including the use of IBM Series 1.

#### SYSTEMS PROGRAMMER

You must be able to offer experience of DJS/VS and POWER-VS system generation and maintenance. An appreciation of OS/VS, batch processing, VSAM or VM 370 would be a considerable advantage. You will join a small team responsible for further developing the sophisticated software environment in which batch, TP and RJE services are operated.

#### APPLICATIONS PROGRAMMERS

You must be able to offer solid Assembler experience, ideally gained under OS/VS, although experience of a compatible language would be an acceptable alternative. You will join a department using IBM ASSEMBLER to develop some of the most advanced investment services available in the world. The company offers excellent working conditions and the technical challenges of the fast moving bureau environment. A policy of promotion from within will enable you to develop a career path related to your own efforts and abilities.

To £8,000

To £6,000

24-hr. answering service  
Please telephone for a confidential discussion or write to:  
30 Fleet Street London EC4Y 1AA  
01-353 0981

### OPERATOR / PROGRAMMER

- \* Minimum £4,200 p.a. + £5.25 LVs per week
- \* Hours 9 a.m.-5 p.m.
- \* Plus usual benefits

West End Oil Company has an immediate vacancy for an Operator/Programmer aged 23+ wishing to learn Data Base Programming. Successful candidate, male or female, will have operated an IBM System 3 Model 15 Computer for a minimum of one year and have an R.P.G. II programming experience. It will be an advantage for candidates to have completed an appropriate IBM programming course. Please telephone Miss S. Miller on 01-437 9876 for an application form:

Caltex (U.K.) Limited  
30 Old Burlington Street  
London W1X 2AR



### DUNDEE COLLEGE OF TECHNOLOGY COMPUTER CENTRE

Applications are invited for the newly established post of

#### SYSTEMS MANAGER / Deputy Director of Computer Services

answering firm expansion and a recent reorganisation of the staff structure of the Computer Centre, which is responsible for all computer services used in the college. The main function of the post will be the management of the Analysis, Planning and Development of software for a variety of interesting technical and commercial applications, systems programming support and an advisory service to users of the college's OCSystem-20 and POP-11 computers. In addition the person appointed will deputies as required for the Director. Applicants should preferably have considerable experience of leading a programme in computer applications in higher education. Salary on the scale £7,155-£7,982 p.a. Financial assistance towards the cost of removal expenses may be payable.

Further particulars and application forms may be obtained from the Administrative Assistant (Establishment), Dundee College of Technology, Bell Street, Dundee DD1 1HG. When completed application forms should be returned by 9th October, 1978.

### What do we offer?

If so, the reading of this advertisement could be the smartest move in your career.

You may or may not have had teaching experience. You will have been involved in commercial or real time software systems.

### Who are we?

We are Educational Services, an important part of Digital Equipment Co. Ltd., the world's largest manufacturer of mini computers.

Our training centre in Reading has 18 classrooms, 30 dedicated computer systems and a staff of more than 70 people for running both hardware and software courses...

### What do you need?

If you consider you have the ability to contribute in these areas we will give you the training and opportunities to develop.

### digital

TIMES NEWSPAPERS LIMITED

## SENIOR PROGRAMMER £7,000

Times Newspapers Limited are currently implementing one of the most advanced computer based newspaper production systems in the U.K., utilising data base and real time techniques on a network of mini-computers.

A Senior Programmer is required who will be responsible to the Group Data Processing Executive for all aspects of software development.

Applicants must have at least five years' mini-computer programming experience, preferably using Hewlett-Packard equipment, and be capable of communicating with all levels of staff and of planning and controlling software development projects. Additionally this position requires several of the following attributes:

- A working knowledge of FORTRAN IV and Assembler languages
- Experience of real time and distributed processing techniques
- The ability to write interface software for non-standard peripherals
- Experience gained in either the newspaper or publishing fields

Salary negotiable depending on qualifications and experience.  
Please write with full personal and career details to:

Douglas Hayes, Employment Manager  
TIMES NEWSPAPERS LIMITED  
200 Gray's Inn Road, London, W.C.1

## Software Analyst/Programmers

£4,400 to £5,800 - West Country

Our client is seeking several Analyst/Programmers to join a small high-calibre team of software professionals. The team is at present working on the design, coding, testing and integration of software programs, with particular reference to Real Time applications.

These opportunities should be particularly attractive to men or women, who possess the following qualifications:

- \* A minimum of HND in Mathematics, Computing Science or an equivalent qualification
- \* Experience of Real Time Software
- \* Experience of PDP 10/11, 40, 60, Argus 700 and Ferranti FM100
- \* Experience of COBOL 66, Algol and Fortran.

Additional salaries, depending on experience and qualifications, are offered, together with a wide range of Company benefits and realistic relocation expenses to a very pleasant rural part of the West Country.

Please write with full details to: Ref 643, Hawson Cowley Recruitment, 36, Queen Square, Bristol BS1 4LU. Please list on a separate sheet companies to which your reply should not be forwarded.

**HCR**  
Bristol

## DUNDEE COLLEGE OF TECHNOLOGY COMPUTER CENTRE

Applications are invited from suitably experienced persons for three posts:

### COMPUTER OPERATIONS SUPERVISOR COMPUTER OPERATOR (TECHNICAL) COMPUTER OPERATOR (TRAINEE)

Rising from expansion and a recent reorganisation of the staff structure of the Computer Centre, which is responsible for all computer services used in the college, the main systems used are DECsystem-20; for Timesharing and Batch and a PDP 11/64 for Real Time and Graphics applications.

The Computer Operations Supervisor will be responsible for the operation of computer facilities, including equipment operation and maintenance, data preparation, job control and assistance to users. Applications should have experience of computer operations in a senior capacity. The salary scale will be £1,383-£4,773 p.a.

The Computer Operator (Technical) will assist with the operation of computer equipment and will also provide technical support for the installation and maintenance of equipment, including terminals, data communications and microprocessor systems. The salary scale will be £3,501-£3,831 p.a.

The Computer Operator (Trainee) will be a young person with suitable qualifications and aptitude for training in the operation of computer equipment. Initial appointment will be on the scale £1,383-£2,895 p.a.; there is a provision for advancement to Computer Operator on the scale £3,478-£3,831 p.a. after satisfactory completion of the period of training.

Financial assistance towards the cost of removal and return may be available.

The application forms may be obtained from: The Administrator, Assistant (Establishments), Room 100, Whitefriars, London EC4Y 7HN. Application forms close on 20th October 1978.

# Assembler/Usercode Programmers Come to New Zealand

## Large system project opportunities

£6000 - £7750

The continued expansion of a large banking system requires us to find additional expertise.

You will join a successful project supporting one of the largest on-line systems in the Southern Hemisphere. This is a central system linked through regional concentrators to a nationwide terminal system, soon to reach the 500 terminal mark with more to come.

Specifically we are looking for an experienced Assembler Programmer/Specialist to support a central System 4 based on-line system using divide/multi-threading techniques. Experience in teleprocessing techniques is an obvious advantage and applicants should be able to communicate easily with both technical and non-technical staff as this is a first line customer support function.

The project is based in ICL New Zealand's Head Office in the centre of Wellington City and overlooking the harbour. Reasonable relocation expenses will be reimbursed by the Company.

If you like the idea of plenty of sun and the outdoor life, away from crowds and commuting then write to: Mr. Andrew Dickson, International Division, ICL, Bridge House, North Putney, London SW15 4XN quoting reference CAV102, Tel: 01 780 7272 ext. 2047.

## International Computers

Think computers - think ICL



## Real Time Coverage Programmers

Continuous expansion of BABS, our REAL-TIME COMPUTER SYSTEM, offers an opportunity for experienced men and women to join a small team of Coverage Programmers at Heathrow Airport to gain valuable experience in large real time system's control, data base management, and operations. Salaries will be in accordance with qualifications and experience and start around £4,000 p.w. with opportunities for progression to more senior positions up to £7,200 p.a. and beyond.

British Airways REAL-TIME COMPUTER SYSTEM provides a worldwide, round-the-clock Passenger Service System which includes Reservations, Departure Control, Fare Quotation and Ticketing. The system is currently based on 370/168 CPU's under the Airline Control Program (ACP) Operating System, with 42 x 3330 and 4 x 2305 online modules handling approximately 2 million enquiries a day from over 3000 on-line terminals. The introduction of more powerful processors is in the planning stage.

The main responsibility of the Coverage Programmer Group is to ensure that the stringent serviceability requirements of the system (over 99% up-time) are met.

Coverage Programmers work closely with all programming groups, Operations and Engineering staff to control the system, and when necessary, rapidly diagnose system

problems and to take corrective action. This function may often be performed without recourse to other programming staff. Coverage Programmers also have responsibilities in the areas of performance monitoring, systems testing, establishment of cut-over procedures, and for producing utility programs which contribute to the overall security of the system.

Candidates should have a minimum of 1 to 2 years commercial programming experience, preferably using Assembler language.

Additionally, experience in systems programming, or systems initialisation, and control would be an advantage.

As one of the world's leading international airlines, British Airways offers excellent conditions of employment which include a holiday pay supplement, inflation-proof pension scheme, subsidised catering, sports and social facilities and favourable holiday air travel opportunities.

Please telephone 01-897 3246/3247 between 9 am and 4 pm for an application form or write quoting reference 2117 CW, MK to: Head of Recruitment and Selection, British Airways, PO Box 10, London Heathrow Airport, Hounslow, Middlesex, TW6 2JA.

British Airways welcomes applications from suitably qualified Registered Disabled persons.

## Programmers

Salary up to £4,917

The Computer Section is responsible for developing and maintaining a variety of systems on the Council's X.1902T installation with communications equipment. It currently has vacancies for three programmers.

### We want

- \* Programmers with at least 6 months' experience in COBOL or PL/I
- \* Experience of ICL 1900, but programmes transfer to other machines will be considered

### We offer

- \* A salary up to £4,917 p.a.
- \* An annual leave entitlement of 20 days PLUS 1st day's leave per month
- \* Pension scheme, subsidised staff restaurant and other benefits
- \* Programming in an interesting variety of applications. Current developments include systems testing and accommodation for the elderly, superannuation records, children, handicapped, etc., with lesser patients, and the induction of older interneophiles for rates and rents.

\* The opportunity to progress. If you show the interest and ability now, say, you will write programme specifications and design small systems under the guidance of a Analyst as a first step onto a Systems role.

Please contact John Alsop, Borough Treasurer, Department, 22-28 Clements Road, Ilford, IG1 18D. Telephone (01) 478 3020, extension 309 or an application form or ring David Hicks, Bank Analyst on extension 124 for further information.

**Redbridge**  
London Borough

### "Opportunities at Brintons"

## COMPUTER PROGRAMMER

Brintons Limited Kidderminster employs 9,000 people in the private carpet manufacturers. In addition to a team of 1,000 workers in the U.K., it has offices and subsidiaries in the U.S.A., West Germany and Australia. The company's Head Office which houses the data processing function is located in Kidderminster, Worcestershire.

The Company wishes to appoint an experienced Computer Programmer to join an established team currently working on 60 ICL 2904 machines.

Applicants, male or female, should possess a minimum of 3 years programming experience and must be thoroughly conversant in the use of COBOL. Some experience of PL/I would be desirable, as well as experience of an ICL application on ICL 2904 machines.

A competitive salary will be paid, commensurate with the nature of the post together with the usual long service benefit. These include an excellent pension and life assurance scheme, and good and sporting facilities. An appropriate car, insurance will be given with relocation expenses.

Please apply in writing, stating age, qualifications, experience and salary history to: Mr. J. W. Bentley, Chairman, Brintons Limited, P.O. Box 18, Exchange Street, Kidderminster, Worcestershire.

Carpet Manufacturers - Advertisers

Bravingtons LTD

## Bravingtons SYSTEMS ANALYST

This is an opportunity for an outstanding systems analyst with full programming experience to be responsible for all aspects of systems support.

To investigate and document present systems, write machine specification, control machine installation, programme testing user manuals, etc.

When the machine is on line you would be responsible for day-to-day control and investigation of further systems.

We advise initially, stock control and sales analysis applications with eventual full accounting functions to be transferred to computer.

We offer the opportunity to become fully involved in all aspects of computer operations and management.

The rewards include franchise salary, free life assurance, free pension, 3 weeks

Please write initially with full curriculum vitae to: Mr. J. W. Bentley, Chairman, Bravingtons Ltd, 204/210 Shifnal Road, Leominster, Herefordshire, HR6 1NN.

# Isn't it time you KO'd that computer recruitment problem?

From October 5th 1978

**COMPUTER WEEKLY**

announces THE NEW ONE-TWO

### 1 ON THE AIR

48,000\* D.P. professionals in the Greater London radio area are told to watch out for your advertisement in that week's Computer Weekly!

### 2 IN PRINT

Your potential employee will have received Computer Weekly at home or at the office and car - immediately turn up your ad!



### How the scheme works

It's a unique opportunity to tie in your Computer Weekly recruitment ad. with a spot on popular Capital Radio - at very low cost. The radio ad. will give tempting outline details of your company and the job you are offering - and will then refer the listener to the appropriate page of Computer Weekly.

### When it happens

It will be broadcast during the morning breakfast-and-drive-to-work period on the Friday of the week in which your advertisement appears. Younger prospects, who are probably late evening listeners, will already have heard it late on the Thursday night.

Each advertiser gets approximately 8 seconds of a full minute-long Computer Weekly commercial. So you share in the cumulative impact of sixty seconds of computer-oriented broadcasting time, at a fraction of the cost of a full "job-spot" commercial.

### Free production

What's more, Computer Weekly will produce your commercial spot free of charge, with highly professional studio and production facilities.

### Cost and Conditions

The rate is £120 a commercial spot of approx. 8 seconds on Capital Radio on both the Thursday and the Friday of the week your advertisement appears.

The copy date remains at 12.00 Tuesday for a broadcast on the following Thursday and Friday. Extraction of the key points from your advertisement will be done by our expert staff - unless you yourself have indicated the points for inclusion.

Unfortunately the ad. you offer cannot be announced over the air, due to the dangers of an escalation in DP staff salaries.

Demo tapes are available for seriously interested advertisers.

### RING CHRIS PRIOR ON 01-261 8028/8658/8000

But hurry! Bookings are strictly rationed until Dec. 1978.

Computer Weekly - The industry journal for the data processing professional.

\*Computer Weekly circulation in Greater London area Sept. 1978

**Software Analysts**

Our client, who is a big name in the Construction Business, require PROGRAMMERS AND ANALYSTS/PROGRAMMERS for their D.P. Department in New Milton, Surrey.

The installation, an NCR 75, uses both Neat/3 and Cobol. Development is in progress on an interactive on-line communications system written in Cobol with Neat/3 being phased out.

Programmers are required with 18 months' experience of Cobol on any machine, or Neat/3 people who would like the opportunity of training. Analysts are required to have at least 1-2 years' involvement in Analyst work.

Salaries for programmers are negotiable around £5,000 and £6,000 for Analysts with the usual big company benefits.

## Systems Programmers

**Crusading**

Our client, an international manufacturer, has a need for Systems Programmers with IBM, ICL or DEC hardware experience. You should be conversant with more than one major hardware and software system. You should also be capable of understanding the characteristics of complex software. Your work will include:

- \* Evaluating software packages
- \* Testing out software facilities and performance
- \* Writing middleware and basic software products
- \* Advising and supporting application programmers

Therefore, we would like to hear from Systems Programmers with at least 2 years' experience who would like the opportunity of being involved in more than one operating system and more than one piece of hardware. Attractive salaries will be paid to the successful candidates.

Ref CW/37/4

## Industrial Control Systems

**Programmers/Designers - Manchester**

ONE OF THE UK'S LEADING SYSTEMS AND SOFTWARE HOUSES needs more staff for its Industrial division centred at Manchester.

Ideally you should have experience of industrial applications in a manufacturing or process plant environment. A background of technical application background will also be of interest. Almost all work will be of a real-time nature on mini or micro computing equipment.

Salaries will range from £4,5k to £7k depending on experience.

This is an excellent opportunity for people who wish to join a small but expanding group of professionals working on the building of advanced and often complex computer control systems for both UK and overseas users.

Ref CW/37/2

**Software Engineering**

**Up to £7,000**

**Basic + Bonus c. £7,000 plus £2,000**

A major international Systems House who are better known for their mainframe work, have a fast expanding Small Business Systems Division.

They have an urgent need to recruit people who range from Programmers with 2-3 years' experience, through to Senior Project Leaders.

All you need is experience of ASSEMBLER on any machine, but if you have experience of SYSTEMS DESIGN, REAL-TIME ORDER ENTRY, OR ORDER PROCESSING so much the better. Projects are all based on Real-Time APPLICATIONS on the ICL SYSTEM 10 and SINGER 1500 hardware.

Project teams usually consist of 2-3 people, allowing you to follow the project from specification through to implementation.

Salaries are well above market rate and the company can offer excellent career opportunities. Annual Bonus, plus usual Company Benefits one would expect from a company of this size.

Ref CW/37/3

## Production Control Software Developers "Minis"

**Germany** **£16,500**

A unique opportunity has arisen based in Germany, for experienced professionals to join a project team being formed to improve an existing operating system and develop a Production Control Package.

The ideal experience may come from a variety of backgrounds in software development or production control, but will probably include some of the following: Operating Systems, Interpreters, T.P. Monitors, File Handling, Database Techniques, Utilities and obviously Real Time Production Control on Minis.

Candidates with Production Control experience must be able to understand the requirements needed and specify the necessary solutions.

Ability to speak German would be useful but will not be a stumbling block. Relocation expenses will be paid to the successful candidate.

Ref CW/37/4

## Programmers & Analysts

**£4.5K - £8K**

Consider the benefits of:

- \* Working in West London
- \* Working on communications systems
- \* Progression to project leadership
- \* Variety of job contact
- \* Programme development through VDU's

If you are a Programmer or an Analyst and have had exposure to commercial applications (on any hardware), our client would be very interested to learn more about you and discuss your future. They are a well-established software house and offer a career path based on real time earning above average salaries and large company benefits.

Projects are divided into small teams and there are many opportunities for men and women with management potential to gain experience in project leadership at a very early stage.

Ref CW/37/5

## Neat/3 Programmer

**West London** **£5,000+**

A small but expanding DP department within a group of private companies requires a PROGRAMMER with at least 18 months' experience of NEAT/3 to help them in their planned expansion program.

The installation, an NCR 75 running under 81 Batch, is soon to be upgraded with the introduction of Real-time applications, thus necessitating the change to COBOL as a programming language.

Therefore we would like to hear from Programmers who would like the opportunity of being retrained in Cobol but staying with NCR hardware.

Situated in West London in new modern offices the company can offer excellent career prospects with the usual company benefits.

Ref CW/37/6



# Central Computing Consultants

KINGSTON: 44 Wood Street, Kingston upon Thames, Surrey, England. Telephone 01-549 3212, Telex 27950  
DUBLIN: Canterbury House, 24 Lower Leeson Street, Dublin 2. Telephone 789577 (5 Lines)

Licensed annually by the Dept. of Employment No SE(B)170

Ref CW/37/7

For further details ring Steve Morton on: 01-637 0781 or alternatively write, enclosing C.V., to: ATA Computer Recruitment, 230 Great Portland Street, London W1N 5HG.

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<b>SYSTEMS ANALYST</b> NORTH LONDON £6,000 + Profit share	<b>TEAM LEADER</b> W. LONDON/HERKS £8,000 + Overseas Travel	<b>PROGRAMMER - MIDDLESEX</b> £7,000	<b>PROJECT LEADER - CITY</b> £12,000 + Sub Mortgage
Major British company who retain ICL 1900 series hardware is expanding rapidly and thus seeks 4 systems analysts with a minimum of 2 years' systems experience. Position includes a variety of new projects. Ideal applicant will have good commercial systems experience previously in ICL environment. This is a senior position and is an ideal opportunity for someone to progress further into management.	International group of companies with its outstanding reputation for efficiency, growth and investment seeks a Team Leader to work for one of their autonomous companies. Ideal applicant will have experience on HONEYWELL hardware and 3 years' programming experience in FORTRAN. Successful candidates will be working initially on a new accounting system with a wide variety of new projects planned. This existing and challenging position involves overseas travel for short periods.	International company manufacturing sophisticated technical products for worldwide distribution seeks programmer for its newly created position. Company have recently installed PDP 11 using BASIC + and consequently require person with good knowledge of the same, with a good personality and strong desire to accept a challenge.	International Financial Institution has vacancy for a Project Leader to lead a team in a major new system development. Looking for someone with at least 8 months experience leading to successful achievement of a significant project preferably in a financial environment. Must have ability to communicate well with all levels of people, able to make mid action on decisions. They need IBM hardware and run under DOS/VSE.
Challenging position with opportunities in variety of areas. Benefits include flexitime, 5 weeks' holiday, free lunch, sports and social club and discount on company products. Excellent prospects.	Excellent company benefits which include non-contributory pension, life assurance, integrated databases, sick pay scheme. RELOCATION assistance if required.	Continued development in a well-planned schedule. Strong in variety of areas. Progressive organisation. Good company benefits which include sports and social club.	Ref. 1701
Ref. 1703	Ref. 1715	Ref. 1742	Ref. 1701
<b>SYSTEMS ANALYST — LONDON</b> £7,500 + Sub Mortgage	<b>SYSTEMS ANALYST</b> N. LONDON/HERKS to £7,000	<b>ANALYST PROGRAMMER</b> CITY £6,500 + Sub Mortgage	<b>SENIOR SYSTEMS ANALYST</b> EAST LONDON £7,000 + Bonus
Highly-reputed firm of Merchant Bankers with worldwide business interests are seeking systems analyst with either financial or insurance experience to work as a key figure within their D.P. services division. Ideal applicant should have worked in an IBM installation but other hardware will be considered.	Leading Insurance company based in North London/Hertfordshire border area is seeking a systems analyst who has programming background preferably in ASSEMBLER and PL/I. The company retains IBM hardware and runs under OS. Position involves working in areas of systems performance analysis and systems development. Ideal applicant will have insurance experience, however the company will consider other experience.	Established Merchant Bankers have opportunity for person with COBOL and PL/I or ASSEMBLER to work as Analyst/Programmer. Ideal applicant will be in mid-20s with a degree and preferably will have worked in a financial environment. CICS would be an advantage but training will be offered. This is a super opportunity to follow a good career path.	Our client, situated about 15 minutes from Liverpool Street and easily accessible to Eastern Home Counties, is seeking a senior systems analyst. Ideal applicant will have a programming background in COBOL preferably in ICL hardware. Company needs people with financial/commercial systems experience e.g. ledger, stock control, payroll, etc.
Excellent working environment. Job security. Full banking benefits including personnel bonus.	Excellent working conditions which include non-contributory pension scheme and subsidised staff restaurant. Sub Mortgage after qualifying period of job security.	Excellent working conditions which include non-contributory pension scheme and subsidised staff restaurant. Banking benefits which include low interest loan and excellent sports / social club.	Ref. 1701
Ref. 1750	Ref. 1778	Ref. 1716	Ref. 1701
<b>SYSTEMS ANALYST — LONDON</b> £7,500	<b>D.P.M — MIDDLESEX</b> £7,000 + Car	<b>SENIOR SYSTEMS ANALYST</b> CITY	<b>SUPPORT ANALYST</b> W. LONDON £6,500 + Co Car
Exciting and challenging opportunity awaits a Systems Analyst within this worldwide and prestigious company. Ideal applicant will have programming background in COBOL and ASSEMBLER and at least 2 years' systems experience. Our client is awaiting the installation of IBM 370 in October and this is a superb opportunity to work in a brand new era on new projects.	Our client, a major British Company with their Head Office in Mid-Staffs., has a vacancy for DPM to be responsible for all aspects of the dept., including prog. and analysis. Ideal applicant will have strong personality, confidence, management capabilities and be able to liaise at all levels. Company retains DEC PDP hardware and seeks person with good programming background. This company offers a fantastic opportunity for young person to progress into management.	Multinational conglomerate company are seeking senior systems analysts with a minimum of 5 years' D.P. experience including commercial analysis in an IBM environment. To undertake responsibility for major project phases. Ideal applicant will have CICS/VS and IMS experience but full training will be given.	One of the fastest growing subsidiaries of a multinational mini-computer manufacturer is moving shortly to build new offices located W. London, adjacent to tube route. They are seeking an analyst to maintain a high level of back-up technical support within their group. Applicants should be familiar with small-medium mini computers with additional knowledge of IBM LIS or System 3. Useful knowledge of COBOL is essential.
Super working environment. Excellent career opportunities. Recruitment of own team. All new development work.	Excellent working conditions. Security in growing organisation. Fantastic fringe benefits.	Continued development with well-planned schedule. Super working conditions including free lunch. Varied projects proving an absorbing and interesting career.	Company expect to expand by 50% in coming year. Excellent training in BASIC and all hardware/software in their product ranges. RELOCATION expenses.
Ref. 1618	Ref. 1705	Ref. 1791	Ref. 1703

For further details ring our London Office 01-734 0152/3010 (24 hours)

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Up to £5,000 plus bonus

Morgan Guaranty, a leading international corporate bank, is expanding its network of international branches.

Responsibility for the development of systems and operating procedures for these new offices rests with a group based in London which provides a support function to new branches.

An outstanding opportunity exists for a programmer/analyst to join the project team to work on assignments supporting the modification and implementation of in-house applications written for NCR 29

**JBA****Software/Process Control Programmers/Designers**

Germany

Opportunities exist for highly skilled and professional software and process control experts to spend some years working in Germany, on a contract basis at highly favourable rates.

There are various projects available, ranging from COMPILER writing to designing and implementing VEHICLE ASSEMBLY CHECKOUT SYSTEMS, each of which is minicomputer based. Why not phone me today, and I will tell you if your background is suitable for any of our current requirements.

Applicants who speak German obviously have an advantage, but for those who do not a special three week course will be arranged at no cost to the individual.

Contact: Jim Baker

**Hardware/Software Support Specialists**

Herts.

c £7,000

A manufacturer of minicomputer-based systems is expanding its troubleshooting hardware and software support teams. The work involves understanding customer problems and resolving them quickly and effectively as well as researching new in-house diagnostic procedures. Candidates should have a sound and detailed technical background, ideally on minis, with experience in Assembly and communications systems.

Competitive salaries will be offered. Significant scope for further career development in an environment where ability, initiative and willingness to take responsibility is recognised.

Contact: Margaret Stevens

**Analyst Programmer**

London

c £7,000

A large international commodity trading organisation with interests in banking and shipping has an opportunity for an experienced d.p. specialist to act up and run a new installation in London.

The company is looking for a person with all round ability to develop and operate commercial systems on a HP3000. Candidate must have several years experience in a systems and programming environment and be self-motivated to cover all aspects of work in the London Data Centre. This appointment obviously has the potential to offer the senior position as the installation expands.

Salary is negotiable but will not be a limiting factor for the right person.

Contact: Jim Baker

For further information on any of the above vacancies please contact the appropriate consultant.

**JAMES BAKER ASSOCIATES, International Personnel Consultants**  
16 Maddox Street, London W1. Tel: 01-491 4478

**Systems Analysts**

London

up to £7,000

We have been retained by a large organisation to recruit a number of Analysts to join existing teams developing advanced real-time applications.

Applicants must have at least three years experience in a d.p. environment with the last year spent in the analysis/design of transaction based systems. Knowledge of database and real-time would be a distinct advantage.

Exceptional opportunity to be involved in the design of sophisticated and unique systems. Salaries according to experience. Non-contributory pension scheme.

Contact: Jim Baker

**Basic + Programmers**

London SE1

start c £5,500

Due to our client's continued success in providing bureau services and turnkey systems to the legal and professional world, their Development Department now has two further vacancies for programmers with at least 18 months BASIC or BASIC+ experience. Applicants should preferably have PDP II and RS/TS/E background.

The group responsible for software development and technical support both to the company and its clients, and plans for the immediate future include developing applications for various MICROSOFTS and as well as for the PDP II's already on-site.

Superb promotion opportunities to Systems Analysis and Project Management - possibly within a year of joining for the most able. Profit sharing scheme, free Life Insurance also available.

Contact: Andy Wright

**Engineers— Field Support**

All areas

up to £6,000 + car

Savaro of our clients, mainly mini/micro computer suppliers or manufacturers, seek experienced Field and/or Support Engineers. Generally, the work involves dealing with a variety of problems associated with hardware and diagnostic software.

**— Hardware and Software Design**

London and Home Counties

up to £7,000

There are excellent opportunities for design engineers to identify, develop and implement mini/micro computer based systems. Experience in either digital electronics, Assembler, data communications, analogue interfacing or real-time systems is essential. The facilities available within the department include LSI 11, Intel and RCA micro-computers and DEC systems.

All positions offer excellent remuneration packages, career prospects and work involvement.

Contact: Margaret Stevens

Contact: Jim Baker

For further information on any of the above vacancies please contact us anyway.

If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

**JAMES BAKER ASSOCIATES, International Personnel Consultants**  
16 Maddox Street, London W1. Tel: 01-491 4478

**OPERATORS & PROGRAMMERS****JUNIOR BURROUGHS OP**

£3500

Up to £3,500. Experience with a d.p. Bureau. Training package given. Job involving £12,000+ salary.

**OPERATOR: IBM DOS/GRASP VS**

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Start on a desk-top system with an S.E. London installation. Basic skills. Excellent prospects and benefits.

**NCR CENTURY OP**

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From Monday to late home on late shift and the opportunity to train on ICB. Trained with a London N.C.R. Commercial PC.

**OPS SUPERVISOR: ICL SYS 3/15B**

to £5,500

Start on a desk-top system with an S.E. London installation. Basic skills. Excellent prospects and benefits.

**RPG II OR COBOL PROGRAMMER**

£6000

CHIPS MORTGAGE and many other big bank jobs with this City Bank outstanding projects.

**SCIENTIFIC/TECHNICAL PROGRAMMERS & DESIGNERS**

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In excess of £5,000. These jobs include the benefit of an international telephone language exchange and either AT&T, CORAL, MAILIN 11, PASCAL or related language or a background of Microprocessor. Minis design.

**INTERVIEWER/OPERATORS**

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Are you already proficient in FORTRAN or can you quickly convert?

Can you actively contribute to interesting interactive commercial or numerical control applications?

These are exceptional opportunities for those prepared to work hard and our client needs good people to join them quickly so please ring Bryan Richmond on Norwich (0603) 867233 (or leave a message).

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We also have other vacancies for COBOL, PL/I and ASSEMBLER programmers of 2+ years' experience and good opportunities for 360/370 operators.

If you want to work in East Anglia why not take advantage of these current opportunities or join our confidential register for jobs in all aspects of computing.

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**PROJECT MANAGER — I.B.M. 370. HERTS.**

An outstanding opportunity for an experienced Analyst wanting to move into management.

This manufacturing company intends to implement a CICS system for order entry/stock control during the early part of 1979, and is looking for an experienced Analyst to run the entire project and advise on the new hardware required.

An unequalled career path for an ambitious (and capable) young Analyst.

**MODCOMP are establishing a UK manufacturing capability and software development programme and, as a result, have vacancies including the following:**

**Software Engineer**

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**Software Designers**

to £9,000 p.a.

**UK Software Support**

to £7,500 p.a. + car

This is a Coventry-based job providing highly technical software support to clients throughout the UK. This requires a detailed background of operating systems and systems software, preferably a real-time communications environment, and a desire to work in a troubleshooting capacity.

For further details ring ANNE CAMPBELL at (0792) 791179 or send a resume to her at MODULAR COMPUTER SERVICES Broad Street, Wokingham, Berkshire

Companies benefits are excellent and include free BUPA and non-contributory pension. Relocation is possible.

Enquiries are invited from candidates with experience of the following: on-line systems under CICS; Database IBM PL/I; modelling, forecasting and simulation; Point of sale data capture; high level languages COBOL or PL/I; APL.

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Tymshare was one of the earliest entrants to the time sharing market in 1966, since that time the Company has grown to 66 computer systems, about 45 of which are performing time-sharing and remote computer functions. Sales and service offices operate throughout America, the United Kingdom, Western Europe and Japan. The Company employs over 2500 people, with approximately 25% engaged in marketing functions.

Tymshare UK's front line Sales Executives introduce the Company and its services to the market-place. These field marketing professionals establish new customer accounts, and expand existing user business by providing an off-the-shelf answer or a custom package tuned to the unique situation presented by a customer. The objective is to furnish the customer a means of direct access to accurate up-to-the-minute information that makes the vital decision making process a quicker and surer one.

A sales or systems background in computer hardware, software or services is a basic qualification in Tymshare's marketing organisation. Candidates are also expected to have a basic understanding of business management functions. For a more detailed account of the Company's current vacancies in Central London contact their Consultants.

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**Scotland** £6,000—£7,200

NCR is a major international company manufacturing sophisticated electronic products. At our Dundee Plant on the attractive East Coast of Scotland, there is a continuing high level of commitment to Systems Development and recent innovations are contributing significantly to the continuous success of the Company.

Applications are invited from Senior Analysts and Project Leaders or from experienced Analysts seeking to further their career in a challenging and fast-moving environment including the use of on-line/reel time techniques. For one of these vacancies, which are open to both men and women, experience of Manufacturing Control Systems would be an advantage.

If you would like to apply for these positions, or you would like more information, please write, including your o.v.t., to:

Mr. Ian Hume, Personnel Services,  
NCR Limited Engineering & Manufacturing,  
Frascati, Dundee DD1 9XW.

**NCR**

### COMPUTER SERVICE ENGINEER BASED JEDDAH — SAUDI ARABIA

To run the computer system and be responsible for its maintenance and data input.

Applicants must have at least 3 years experience in the maintenance of computer peripherals including visual display units, disk drives, printers and cartridge tape drives.

All training will be given.

Applicants must have ICL Electronics or Electrical Engineering qualifications.

A 1 year probationary period followed by a 3 month probationary period.

**DETAILED REQUISITION FORM** available from the Personnel Manager, NCR Ltd., Frascati, Dundee DD1 9XW.

Interviews will be held in London on 27th September.

Individuals should apply in writing to:

Mr. D. A. G. Smith, Personnel Manager, NCR Ltd., Frascati, Dundee DD1 9XW.

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Project Managers  
A\$19,000-A\$28,000

You work can cover all aspects of projects, from selling, feasibility investigation, estimation and negotiation to responsibility for implementation, customer liaison and acceptance. You will also be involved in recruiting project teams. You are likely to have had a successful record of leading a team in a significant project, preferably encompassing systems feasibility and systems requirement investigation through design code testing and implementation. Experience of hardware evaluation, implementation and facilities management would be a bonus.

Designers and Program Specialists  
A\$13,000-A\$20,000

You will ideally have gained experience with a software house and will be able to demonstrate a record of achievement in relevant specialist areas like those outlined.

If the wide horizons we can offer in Australia attract you and you can meet our requirements, then write without delay to Carole Hudson, ICL Bridge House North, Putney Bridge, London SW6 3JX quoting reference C1W120 (tel. 01-788 7272 ext. 2047). John Offord, Manager Dataskil (Australia) will be interviewing in London during mid-July.

Dataskil (Australia)  
The Computer ProfessionalsMICROPROCESSING  
To £6,500+You are an experienced assembler programmer with a background in real-time or operating  
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